

**Subsaharan Ceratopogonidae (Diptera) VI.
New species and records of South African Biting Midges
collected by A. L. Dyce**

by

Botha de Meillon¹ and Willis W. Wirth²

SYNOPSIS

The study of a collection of Ceratopogonidae made in South Africa by A. L. Dyce resulted in the identification of 26 species in 15 genera. Many were reared from pupae and preserved with the associated pupal exuviae. Thirteen new species are described in 11 genera: *Forcipomyia pulla*, *F. warreni*, *Dasyhelea salinaria*, *D. fontana*, *Alluaudomyia louisi*, *Parabezzia stagni*, *Stilobezzia orientis*, *Homohoelea albitudinis*, *Macropenza gearyi*, *Mallochohelea fluminea*, *Sphaeromyia theileri*, *Bezzia amana* and *Palpomyia magali*. The previously unknown pupal stages are described of *Forcipomyia ashintii* Ingram & Macfie and *Dasyhelea pallidihalter* Carter, Ingram & Macfie; the male and pupa of *Stilobezzia limnophila* Ingram & Macfie, and the female and pupa of *Homohoelea delanoe* (de Meillon). *Palpomyia sanctaeluciae* de Meillon is transferred to *Homohoelea*. Keys are presented for the determination of the Subsaharan species of *Homohoelea* and *Mallochohelea*. A list of collection data is provided, together with a list of species reared from each collection.

INTRODUCTION

This is the third in a series of papers reporting a collection of South African biting midges which we have received for study through the courtesy of Brian R. Stuckenberg, Director of the Natal Museum, Pietermaritzburg, Republic of South Africa. In the first paper (de Meillon & Wirth, 1979) we described the *Forcipomyia* subgenus *Rhinohelea*, for two very distinctive new species possessing an elongate proboscis that were collected in the mountains of the Southwest Cape. In the second paper (de Meillon & Wirth, 1981) we described *Kolenohoelea*, a new genus of Stilobezziini for several very distinctive South African species with swollen hind femora.

In the present study we report on a superb collection made in South Africa by Alan L. Dyce of the CSIRO McMaster Laboratory, Sydney, Australia, most of which was obtained by rearing from pupae which were collected in a survey of habitats of the bloodsucking species of *Culicoides* that may be associated with transmission of bluetongue disease of cattle and sheep. We consider it important to report on this collection as a unit because, in addition to presenting an unusual proportion of new species, it offers an opportunity to describe the pupal stage of species in a wide variety of genera, and to report habitat data and species associations from a wide variety of larval habitats.

We give special thanks to Dr Stuckenberg for extending to us the privilege of studying this material. The holotypes are deposited in the Natal Museum,

¹ South African Institute for Medical Research, Johannesburg. Cooperating Scientist, Systematic Entomology Laboratory, USDA.

² Systematic Entomology Laboratory IIBIII, Agr. Res., Sci. & Educ. Admin., USDA, c/o U.S. National Museum, Washington, D.C. 20560, U.S.A.

Pietermaritzburg; paratypes, when available, will be deposited in the collections of the South African Institute for Medical Research, Johannesburg; the Australian National Collection, Canberra; the British Museum (Natural History), London; and the United States National Museum of Natural History, Washington, D.C. All material (Appendix) except otherwise noted was collected by A. L. Dyce; the light trap material from the collection is not treated in detail except for the new and unusual species.

Much of the terminology for the morphological characters of the Ceratopogonidae was established in the early basic papers on the West African fauna by Carter, Ingram & Macfie (1920–21), and by Edwards (1926) on the British biting midges. More up to date reviews were given by Wirth (1952) and Tokunaga & Murachi (1959). Our taxonomic arrangement follows that outlined by Wirth (1962) and Wirth *et al.* (1974, 1977).

In our descriptions we use the following special terminology: wing length is measured from the basal arculus to the wing tip; the costal ratio is obtained by dividing the costal length (from the basal arculus) by the wing length. The antennal ratio is obtained by dividing the combined lengths of the five distal flagellar segments in females (the elongated three or four distal segments in males) by the combined length of the remaining proximal flagellar segments. The tarsal ratio is the length of the first tarsomere divided by the length of the second.

NOTES AND DESCRIPTIONS OF SPECIES

Genus *Forcipomyia* Meigen

Forcipomyia (Forcipomyia) ashantii Ingram & Macfie (Figs 1–4)

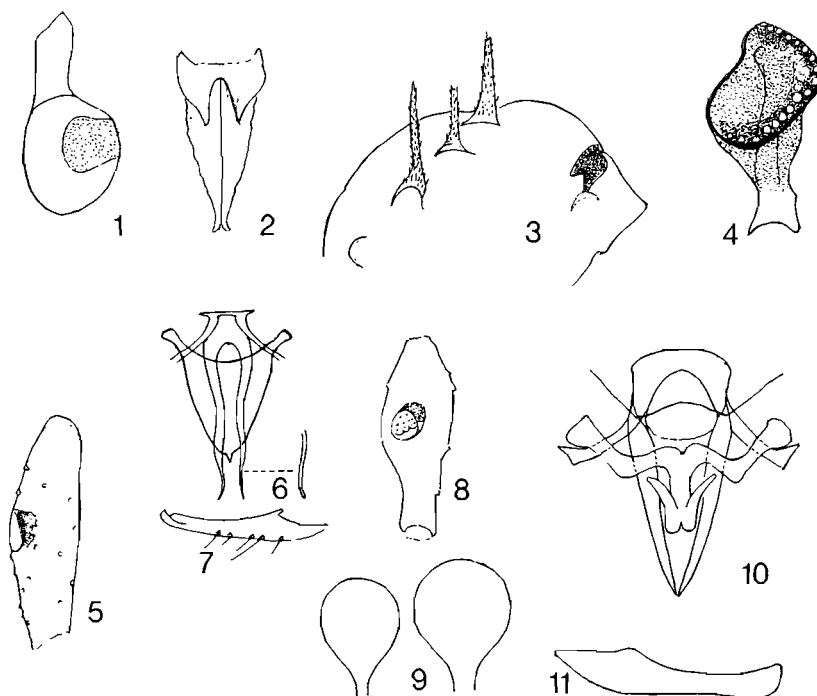
Forcipomyia ashantii Ingram & Macfie, 1924: 589 (♂; Ghana); Dessart, 1962: 143 (♀; Congo); Dessart, 1963: 39 (♂, ♀ redescribed; figs; distribution).

The female of this moderately large brownish species is distinguished by the unornamented brownish legs and presence of one small yellowish spot on the wing at the end of the second radial cell. The palpus (Fig. 1) is expanded at the base with a deep sensory pit bearing a smaller external pore. The male is most distinctive, the genitalia having a distinct caudomedian notch on the ninth sternum and a characteristic patch of short stout spines on the mesal margin of the basistyle near the base. We can offer a description and figures of the pupa, which has not been described.

Pupa. Length 3.0 mm; exuviae uniformly yellowish brown, with the respiratory horns contrasting dark brown. Respiratory horn (Fig. 4) short, with slender base abruptly expanded to a bulbous distal portion with smooth integument bearing a distal palisade of 18–20 small, simple, spiracular openings. Cephalothorax (Fig. 3) bearing dorsally three pairs of long spiculate processes and a low rounded lobe. Male terminal segments as in Fig. 2.

Distribution. Widespread in Subsaharan Africa; also reported from Malaysia.

Material examined. SOUTH AFRICA: *Transvaal*. Burgershall Tropical Fruit Res. Station, Hazyview, 3.xii.1973 (no. 73.360), reared from rotting pseudostems of banana, 1 ♂ 3 ♀, with pupal exuviae.



Figs 1-11. *Forcipomyia* species; 1-4, *F. ashantii*; 5-7, *F. pulla*; 8-11, *F. warreni*: 1, female third palpal segment; 5, 8, male third palpal segment; 2, caudal segments of pupa; 3, cephalothorax of pupa, lateral view; 4, respiratory organ of pupa; 6, 10, male aedeagus and parameres; 7, 11, male dististyle; 9, female spermathecae.

Forcipomyia (Forcipomyia) biannulata Ingram & Macfie

Forcipomyia biannulata Ingram & Macfie, 1924: 557 (♂, ♀; Ghana; figs); Dessart, 1963: 45 (redescribed; synonymy; figs; distribution).

Distribution. Widespread in Africa, Madagascar, Réunion, Seychelles, Canary Islands.

Material examined. SOUTH AFRICA: *Transvaal*. Hectorspruit, 29.xi.1973 (no. 73.364), from fallen fruit of sausage tree, many ♂ & ♀, pupal exuviae.

Forcipomyia (Forcipomyia) pulla sp. n. (Figs 5-7)

Male. Described from the holotype. Wing length 1.3 mm. A uniformly dark species without scales on wings or elsewhere.

Head: Occiput, proboscis, palpi and antennae uniformly dark brown. Eyes widely touching in front, bare. Antenna dark brown including plume; relative lengths of segments XII-XV, 80-50-30-55; antennal ratio 1.0. Palpus five-segmented; third segment (Fig. 5) slightly swollen in midportion where there is a fairly deep sensory pit; II more than half as long as III which is slightly longer than IV+V.

Thorax: Uniformly dark brown including pleuron, scutellum and postnotum; scutellum with 12 long bristles and a few smaller ones. Wing unicolorous except for slight darkening of radius and costa, without scales but densely covered with

macrotrichia leaving no noticeable bare lines along veins; junction of costa and radius swollen and apparently without a cell; costal ratio 0,38. Legs brown to dark brown throughout and without banding; apex of hind tibia with apical row of eight long bristles and a subapical comb of 14 short, rather stout, brown bristles; fore tibia with subapical comb of rather long transparent spines; tarsal ratios of fore, mid, and hind tarsi 1,0, 0,69, and 0,74; hind basitarsus slightly swollen with a row of eight strong bristles along ventral side; hind tarsomere II with a similar row of ten such bristles; tarsomeres I and II of fore and midlegs with similar bristles; claws long, narrow and moderately curved; empodium well developed.

Abdomen: Dark brown with venter paler; genitalia as in Figs 6–7.

Female. Unknown.

Distribution. South Africa.

Type. Holotype ♂ (NM–2446), Sterkstroom, E. Louis Trichardt, N. Transvaal, 30–31.xii.1973, A. L. Dyce (no. 73.396), light trap.

Discussion. Among the African species of *Forcipomyia* with genitalia similar to those of *F. pulla*, this species comes nearest *cirrrosa* Clastrier, Rioux & Descous, *suberis* Clastrier, and *tigripes* Ingram & Macfie. The last-named species can immediately be eliminated because of its banded legs. *F. suberis* is separable because of its greatly enlarged basistyle and dististyle and stouter parameres; other differences include the basally swollen third palpal segment, the greater wing length, and banded legs. From *cirrrosa*, the new species differs in palpal structure, the third segment being swollen in midportion, the wing is shorter (length 1,3 mm vs. 1,6 mm), the abdomen is unbanded, and the dististyle is gradually narrowed to the apex and not abruptly constricted apically.

***Forcipomyia* (*Schizoforcipomyia*) *warreni* sp. n. (Figs 8–11)**

Male. Described from the holotype. Wing length just over 1,0 mm. A small dark species with narrow pale subbasal band and narrow pale apex on hind tibia; wing ornamented with patches of long narrow dark brown scales.

Head: Occiput very dark brown. Eyes with only a very narrow line of separation over their whole width in front, bare. Antenna with segment II dark brown, remainder perceptibly paler; relative lengths of XII–XV, 55–35–27–32; antennal ratio 1,0. Palpus (Fig. 8) five-segmented, dark brown, III slightly longer than IV+V, swollen on proximal half with fairly deep sensory pit located just before midlength. Proboscis shorter than palpus, dark brown.

Thorax: Whole of thorax including pleuron and scutellum dark brown. Wing ornamented with conspicuous areas of dark brown narrow scales, in addition with a patch of these scales midway between end of costa and apex of wing, otherwise with paler hairs; no radial cell evident; costal ratio 0,38. Legs brown, slightly paler at knees; in addition hind tibia with narrow subbasal pale band and pale apex for a distance slightly in excess of width of segment; hind tibia with an apical row of six long bristles and a subapical comb of about 18 closely set colourless spines; fore tibia with subapical comb of closely set teeth; tarsal ratios of fore, mid and hindlegs, 1,3, 1,0 and 1,0 respectively; in addition to many bristles the

legs are well provided with narrow scales as on wing; claws small; empodium well developed.

Abdomen: Dark brown. Genitalia similar to those of *F. borbonica* Clastrier, *anna* de Meillon, and *rudebecki* de Meillon. Basistyle slightly more than twice as long as broad, dark brown; dististyle (Fig. 11) pale yellow and contrasting strongly with basistyle, with a slightly expanded, rounded tip, thus differing from related species. Aedeagus (Fig. 10) heavily sclerotised and appearing blackish, differing thusly from that of *borbonica*, with shape resembling that of *anna* and *rudebecki* but with the lateral arms abruptly angled and the distomedian process shorter and deeply bifid and bent ventrocephalad. Parameres (Fig. 10) joined basally deep in ninth segment; each arm a long sclerite gradually narrowing to a sharp point, thus differing from *anna* and *rudebecki* but resembling *borbonica*.

Female. Described provisionally from a female captured at the same time and place as the holotype. Wing length 0,95 mm. Generally resembling male in colour, wing and leg markings except as noted.

Head: Eyes closely approximated over their entire width; bare. Antenna segment I with numerous long setae, II with similar but fewer setae; distal segments very gradually lengthening to apex without any dramatic change, ie. relative lengths of VIII–XV, 30–30–30–35–40–40–40–42; antennal ratio 1,25; segments IV–XIV flask-shaped. Palpus as in male, but with sensory pit located slightly more distad at about midlength; pit of same type as in male.

Thorax: Colour as in male. Wing with two dark areas resulting from accumulation of dark scales, one at end of costa and other midway between it and wing tip; costal ratio 0,47; costa slightly longer than that of male. Legs as in male, but additional, though faint, pale bands midway on fore and mid femora and subbasally on all tibiae.

Abdomen: As in male, dark brown throughout but scales on dorsum much broader. Spermathecae (Fig. 9) two, very dark, flask-shaped with pronounced neck, one slightly smaller than other, measuring 0,050 by 0,038 mm and 0,044 by 0,031 mm respectively.

Distribution. South Africa.

Type. Holotype ♂ (NM–2447), Sterkstroom, E. Louis Trichardt, N. Transvaal, 30–31.xii.1973, A. L. Dyce (no. 73.396), light trap. 2 ♀ (one subsequently lost) were taken at the same time and place. The one remaining is not made a paratype because of the differences in leg markings and thus questionably associated with the holotype.

Discussion. The species is named for Dr E. Warren, who in 1903 became the first director of the Natal Museum. He founded the *Annals of the Natal Museum* which have served as an estimable outlet for scientific publication since 1906.

The association of the female with the male holotype is uncertain but likely. Among a large number of specimens taken in the light trap at this place they were the only ones resembling the male to any degree. We could not match them with any other Subsaharan *Forcipomyia* species.

Genus *Dasyhelea* Kieffer*Dasyhelea inconspicua* Carter, Ingram & Macfie

Dasyhelea inconspicua Carter, Ingram & Macfie, 1921: 191 (all stages; figs; Ghana); de Meillon, 1937a: 371 (Zululand record); Macfie 1943: 149 (in key; Egypt; 3 new varieties described).

Distribution. Ghana, Mozambique, Sudan, South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Leamington, Matlabas, 7.xi.1973 (no. 73.321), from brackish spring head, 1 ♂. Sterkrivier Rd. SW Potgietersrus, 3.i.1974 (no. 74.108), roadside seepage bank, 17 males & females. Zoutpan, 10.i.1974 (no. 74.110), hoof holes in sandy creek bed, 1 ♂. *Cape Province*. Stella, 17.i.1974 (no. 74.125), margins of large brack pan, 2 ♂. All with pupal exuviae.

Notes on Pupa. Carter *et al.* (1921) described the pupa but did not figure it. The structure of the respiratory horn allies the species closely with *D. pallidihalter* C. I. & M., but in *inconspicua* the horn is shorter, only 0,2 mm rather than 0,3 mm long, and there are eight rather than 5–6 apical spiracular openings.

Dasyhelea salinaria sp. n. (Figs 12, 15–19, 24)

Described from the holotype male and allotype female and their associated pupal exuviae.

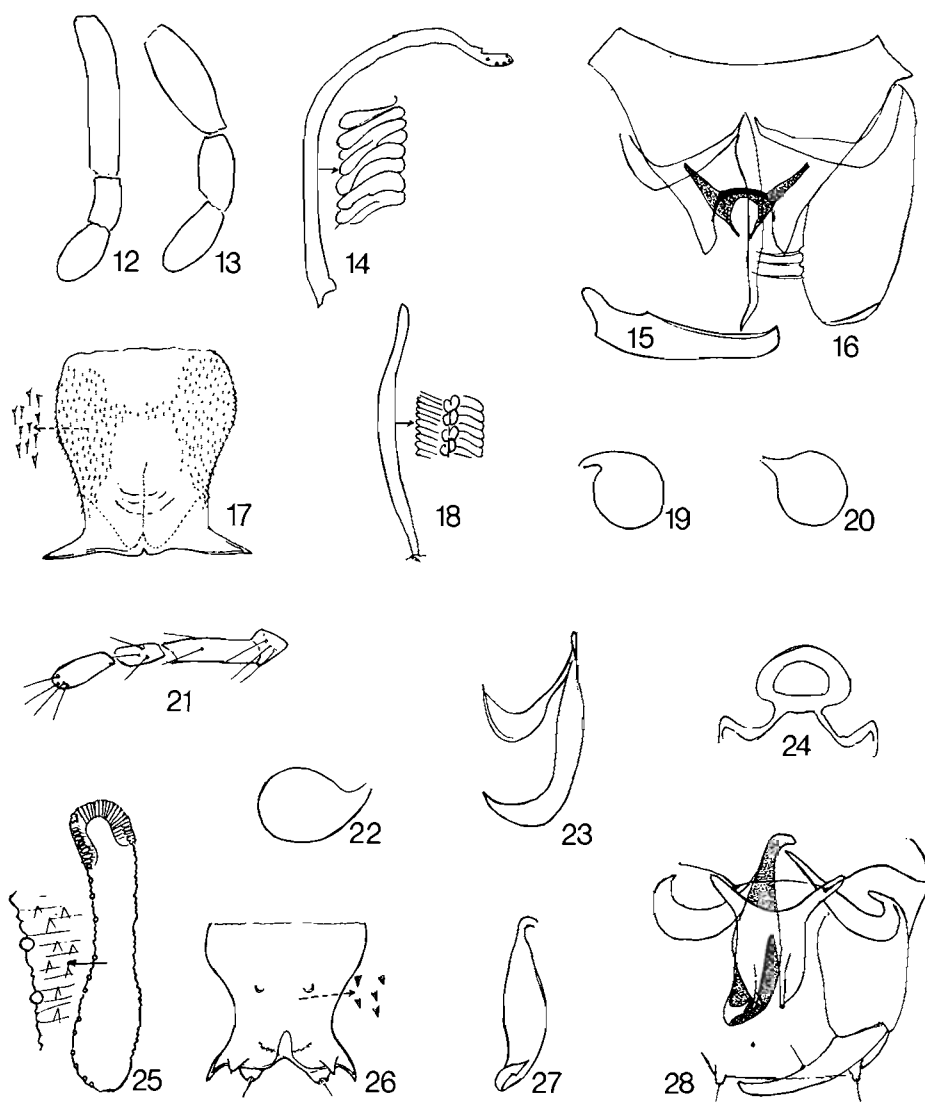
Holotype ♂. Wing length 0,7 mm. A dark brown species without any distinctive markings.

Head: Eyes narrowly separated in front by less than the width of an ommatidial facet, apparently hairy. Antenna with pale flagellum and dark brown plume; relative lengths of segments XII–XV, 55–55–40–40; antennal ratio about 1,0 (terminal segments slightly collapsed). Palpus (Fig. 12) five-segmented, longer than proboscis, very pale in colour; third segment not swollen, without sensory pit, and longer than IV and V combined.

Thorax: Dark brown dorsally, pale laterally above the paratergite; scutellum mostly yellow; postnotum dark brown; pleuron except for pale membranous areas dark brown. Wing unicolorous with moderate number of macrotrichia, bare lines present along veins; radial cells absent or reduced to mere slits; costal ratio 0,43. Legs uniformly pale, without any strong spines or setae; claws small; empodium undeveloped.

Abdomen: Brown, slightly paler beneath. Genitalia (Figs 15–16) as in the *fusca* group of species, resembling those of *D. biannulata* Clastrier, Rioux & Descous, but differing in conformation of posterior margin of ninth sternum.

Female (allotype). Wing length 0,6 mm. Eyes hairy. Palpus with segment III longer than IV+V combined. Antenna with segments XI–XV subequal, hardly different from III–X; antennal ratio 0,70. Wing and legs as in male. Abdomen with coloration as in male; genital sclerotisation (Fig. 24) closely resembling that of *D. pallidihalter* C. I. & M. Spermatheca (Fig. 19) single, dark brown; retort shaped, measuring 0,028 mm in diameter, the neck 0,005 mm.



Figs 12–28. *Dasyhelea* species; 12, 15–19, 24, *D. salinaria*; 13–14, 20, *D. pallidihalter*; 21–23, 25–28, *D. fontana*: 12–13, 21, male palpus; 14, 18, 25, respiratory horn of pupa, enlarged detail of lateral spiracles shown separately; 15, male dististyle; 16, 28, male genitalia; 17, 26, terminal segment of pupa, enlarged detail of integumental spinules shown separately; 19, 20, 22, female spermathecae; 23, 27, lateral view of parameres; 24, female genital sclerotisation.

Pupa. Length 2,2 mm; exuviae pale yellow in colour without any conspicuous spines, setae or tubercles. Respiratory horn (Fig. 18) long, slender, and flexible, measuring 0,38 mm in length; internal structure complicated and obscure. Abdominal segments with numerous small, sharp, backwardly directed spines, especially prominent laterally on ninth segment as illustrated (Fig. 17); caudal processes of terminal segment short, sharp, and directed at right angles to main axis of abdomen. In the process of mounting in balsam the respiratory horn often curls up making its examination difficult; it is best observed in spirit.

Distribution. South Africa.

Types. Holotype ♂ (NM-2448), allotype ♀, 1 ♀ paratype, each with associated pupal exuviae, all with same data: Leamington, Matlabas, N. Transvaal, 7.xi.1973, A. L. Dyce (no. 73.321), reared from a brackish spring head.

Discussion. The male of *D. salinaria* is readily separable from that of *D. biannulata* Clastrier, Rioux & Descous (which it resembles in the shape of the posterior border of the ninth tergum) by the absence of leg banding and by the length of the third palpal segment (Fig. 12). The females described above resemble the male in every way including details of the pupal exuviae. The sclerotisations of the female genitalia are exactly as described by Clastrier & Wirth (1961) for *D. pallidihalter* C. I. & M. Females of these species are also similar in other features, but the spermatheca of *salinaria* (Fig. 19) is retort-shaped with oblique neck, whereas in *pallidihalter* the neck is not bent (Fig. 20). Differences in the pupal respiratory horn are shown in Figs 14 and 18. It should be further noted that *D. salinaria* was taken in an aquatic habitat whereas *pallidihalter* was bred from rotting material at the base of a banana plant, and in Dyce's collection it was bred from the rotting fruit of the sausage tree.

Dasyhelea pallidihalter Carter, Ingram & Macfie (Figs 13-14, 20)

Dasyhelea pallidihalter Carter, Ingram & Macfie, 1921: 184 (all stages; Ghana; figs); Clastrier & Wirth, 1961: 326 (♂, ♀ redescribed: figs; distribution).

Distribution. Ghana, Gambia, South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Lodwicks Lust, Hectorspruit, 21.i.1974 (no. 74.153), bred from fallen fruit of sausage tree, 64 ♂ & ♀, with pupal exuviae.

Note. Pupal operculum with three large mound-like tubercles and surface with dense blunt spinules; respiratory horn (Fig. 14) long and slender with fine transverse striations, apex with 5-6 terminal and a few scattered lateral spiracles. Female palpus as in Fig. 13.

Dasyhelea flava Carter, Ingram & Macfie

Dasyhelea flava Carter, Ingram & Macfie, 1921: 196 (all stages; figs; Ghana); Clastrier, 1959: 413 (♂, ♀ redescribed; figs; Reunion).

Distribution. Ghana, Gambia, Ethiopia, Réunion, South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Hazyview, Tropical Fruit Res. Station, 3.xii.1973 (no. 73.359, 73.360), from rotting banana pseudostem, 5 ♂ 5 ♀, with pupal exuviae.

Note. This species is easily recognized by the characteristic male genitalia with bifid, hook-like dististyles. The pupal respiratory horn is very similar to that of *D. pallidihalter*, but the conical tubercles on the operculum are shaped differently.

Dasyhelea fusca Carter, Ingram & Macfie

Dasyhelea fusca Carter, Ingram & Macfie, 1921: 204 (♂, ♀, pupa; Ghana; figs); de Meillon, 1942b: 14 (in key); Macfie, 1943: 149 (Egypt; notes).

Distribution. Ghana, Egypt, Madagascar, Mozambique, South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Doornpan, Bulge River, 6.xi.1973 (no. 73.318), in algae-covered sand in overflow from aviary, 22 ♂, 16 ♀, pupal exuviae. Leamington, Matlabas, 7.xi.1973 (no. 73.320), stock tank overflow, 1 ♀. Sentrum, 8.xi.1973 (no. 73.324), leaking stock trough, 2 ♀. Lydenburg, 26.xi.1973 (no. 73.341), moss band with silt in cement water drain between fish tanks, 14 ♂ & ♀. Lodwicks Lust, Hectorspruit, 29.xi.1973 (no. 73.348), irrigation drain waste water, 9 ♂ & ♀. 20 km S Komatipoort, 1.xii.1973 (no. 73.355), overflow from stock water tank, 10 ♂ & ♀. 15 mi SE Potgietersrus, 3.i.1974 (no. 74.105), margins of small hill stream, 1 ♂. Zoutpan, 10.i.1974 (no. 74.110), hoof holes in sandy creek bed, 1 ♂. *Cape Province*. 10 mi NE Douglas, 23.i.1974 (no. 74.146), rain-water pool, 1 ♂. All with associated pupal exuviae.

Dasyhelea fontana sp. n. (Figs 21–23, 25–28)

Holotype ♂. Wing length 1.3–1.4 mm. Thorax dark brown; scutellum yellowish; dorsum of abdomen dark brown; legs much paler with a dark brown subapical patch on hind femur.

Head: Dark brown; eyes narrowly separated, hairy. Antenna dark brown, of normal structure for the genus; relative lengths of segments XI–XV, 20–40–40–34–50; antennal ratio 1.0. Palpus (Fig. 21) pale brown, longer than proboscis; five-segmented with III long and slender, without sensory pit and shorter than IV+V.

Thorax: Mesonotum dark brown with a few strong bristles; scutellum yellowish with about ten strong bristles and a few small hairs; postnotum dark brown; pleuron except for paler membranous areas, dark brown. Wing unicolorous, with bare areas along veins; radial cells vestigial; costa reaching scarcely past mid-length of wing. Legs pale with dark knee spots and a fuscous subapical patch on hind femur; hind tibia with a row of eight short dark spines apically and a subapical comb of about 16 short, strong, dark spines, distal spur short, curved, and obscure; fore tibia with dense slanted comb of long transparent teeth which could not be counted; distal spur readily visible but not strongly developed.

Abdomen: Dark brown above, paler ventrally. Genitalia (Figs 23, 27–28) of the usual type seen in members of the *fusca* group of species, with a combination of specific differences; ninth sternum moderately excavated with small pigmented horns; ninth tergum with poorly developed apicolateral processes; aedeagus with each distal arm split; median process of parameres swollen in midportion.

Female (allotype). Wing length 1.2 mm. General coloration as in male. Head as in male, eyes closely approximated, hairy. Antenna from the globular fourth

segment becoming more vase-shaped to the 14th, which has an obvious neck; XV elongated, about twice the length of XIV. Legs as in male. Wing slightly shorter than in male, but costal ratio just over 0,5; radial cells absent. Abdomen as in male. Spermatheca (Fig. 22) single; strongly sclerotised, retort-shaped with the neck narrowing to the apex; measuring 0,088 by 0,057 mm including neck.

Pupa. Length 3,5 mm. Dark brown with characteristic respiratory horn. Cephalothorax with some pigmented spots dorsally but no pronounced tubercles, spines or setae; shagreening absent. Respiratory horn (Fig. 25) flattened, transversely striated with fan-shaped apex bearing about 30 spiracular openings; in addition about twelve such openings distributed along one side as figured. Abdomen as usual in the genus with flat semicircular tubercles dorsally and some conical ones laterally, especially pronounced on posterior segments; shagreening pronounced dorsally and apically where segments VIII and IX are densely covered with short, strong, dark spines; caudal processes of segment IX (Fig. 26) short, strongly divergent, caudal setae more robust than usual and located on prominent tubercles.

Distribution. South Africa.

Types. Holotype ♂ (NM-2449), allotype ♂, 2 ♂ paratypes, 25 mi E Middelburg, Sewefontein, Transvaal, 5.xii.1973, A. L. Dyce (no. 73.366), reared from brackish pan.

Discussion. The combination of features of the male genitalia and pupal respiratory horn separates this species from its closely related congeners.

Dasyhelea gigantosálpinx de Meillon

Dasyhelea gigantosálpinx de Meillon, 1937a: 371 (♂, ♀, pupa; Zululand; figs; bred from algae in a seepage pool, Umlazi River).

Distribution. South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Jam Tin Creek, Malelane, 2.xii.1973 (no. 73.357), margin of running stream, 3 ♀ with pupal exuviae.

Note. The pupa has very characteristic long, black, filamentous, convoluted respiratory horns, about as long as the body of the pupa, the horn with deep transverse corrugations and not bearing any discernible spiracular openings. The single oval female spermatheca has a large opening to the duct.

Dasyhelea tugelae de Meillon

Dasyhelea tugelae de Meillon, 1936: 197 (♂, ♀, pupa; Natal; bred from rock pools in Tugela River; figs).

Distribution. South Africa, Zimbabwe.

Material examined. SOUTH AFRICA: *Transvaal*. Onderstepoort, 8.xii.1973 (no. 73.368), in drain from roof catchment, 4 ♂, 3 ♀. 7 km S Messina, 26.xii.1973 (no. 73.387), crotch in baobab tree, 3 ♂, 5 ♀. ½ mi N Tropic Capricorn on Louis Trichardt Rd., 1.i.1974 (no. 74.101), tree cavities in candelabra trees, 1 ♂, 6 ♀. 15 mi SE Potgietersrus, 3.i.1974 (no. 74.106), tree hole, 7 ♂, 7 ♀. All with associated pupal exuviae.

Note. This species is very close to *D. thompsoni* de Meillon but can be distinguished by the shorter apicolateral processes on the male ninth tergum, the subequal posterior processes on the male aedeagus, and the lesser number (12–15) of spiracular openings on the pupal respiratory horn. All material we identify here as *D. tugelae* comes from tree holes and similar non-terrestrial habitats, while the types came from rock pools.

Dasyhelea thompsoni de Meillon

Dasyhelea thompsoni de Meillon, 1936: 202 (♂, ♀, pupa; Transvaal; bred from rock pools in river; figs).

Distribution. South Africa, Nigeria.

Material examined. SOUTH AFRICA: *Natal*. Giants Castle Res., Drakensberg Mts., 5800 ft, B. Stuckenberg and M. Irwin, 2 ♂ 2 ♀, pupal exuviae. *Transvaal*. Doornpan, Bulge River, 6.xi.1973 (no. 73.318), algae covered sand in overflow from aviary, 1 ♂. Lodwicks Lust, Hectorspruit, 19.xi.1973 (no. 73.351), shaded rock pool in creek, 1 ♂ 1 ♀. Sabi River Area (mountain top), 3.xii.1973 (no. 73.362), rock pools in 'Tabletop Sandstone,' 1 ♂ 3 ♀. Louis Trichardt Rd., 1.i.1974 (no. 74.102), rock pool in granite outcrop, 4 ♂ 6 ♀. All with associated pupal exuviae. NIGERIA. Zaria, Kujena Inselberg, 8.vi.1973, V. G. F. Smith, reared from stone grinding hollow, 1 ♂ 1 ♀, 2 larvae, 3 pupae.

Genus *Alluaudomyia* Kieffer

Alluaudomyia melanosticta (Ingram & Macfie)

Thysanognathus melanostictus Ingram & Macfie, 1922: 248 (♂; Ghana; figs).

Neoceratopogon melanostictus (Ingram & Macfie); Macfie, 1924: 66 (combination; ♀; Egypt).

Alluaudomyia melanosticta (Ingram & Macfie); de Meillon, 1939b: 8 (combination; in key); de Meillon & Hardy, 1954: 65 (notes); Clastrier, 1958: 288 (♂ redescribed; figs; Senegal).

Distribution. Widespread in Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Lydenburg, fish hatchery, 26.xi.1973 (no. 73.342), lily pond margins, 3 ♂ 1 ♀ with pupal exuviae. Zoutpan, 10.i.1974 (no. 74.110), hoof holes in sandy creek bed, 1 ♂ with pupal exuviae.

Alluaudomyia natalensis de Meillon

Alluaudomyia natalensis de Meillon, 1939b: 14 (♀; figs; Zululand).

Distribution. South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Sand River on road between White River and Hazyview, 2.xii.1973 (no. 73.358), stream margins, 1 ♂ and pupal exuviae. 15 mi SE Potgietersrus, 3.i.1974 (no. 74.105), margins of small hill stream, 1 ♀ with pupal exuviae.

Alluaudomyia lousi sp. n. (Figs 29–38)

Described from the male holotype, one male paratype, and female allotype.

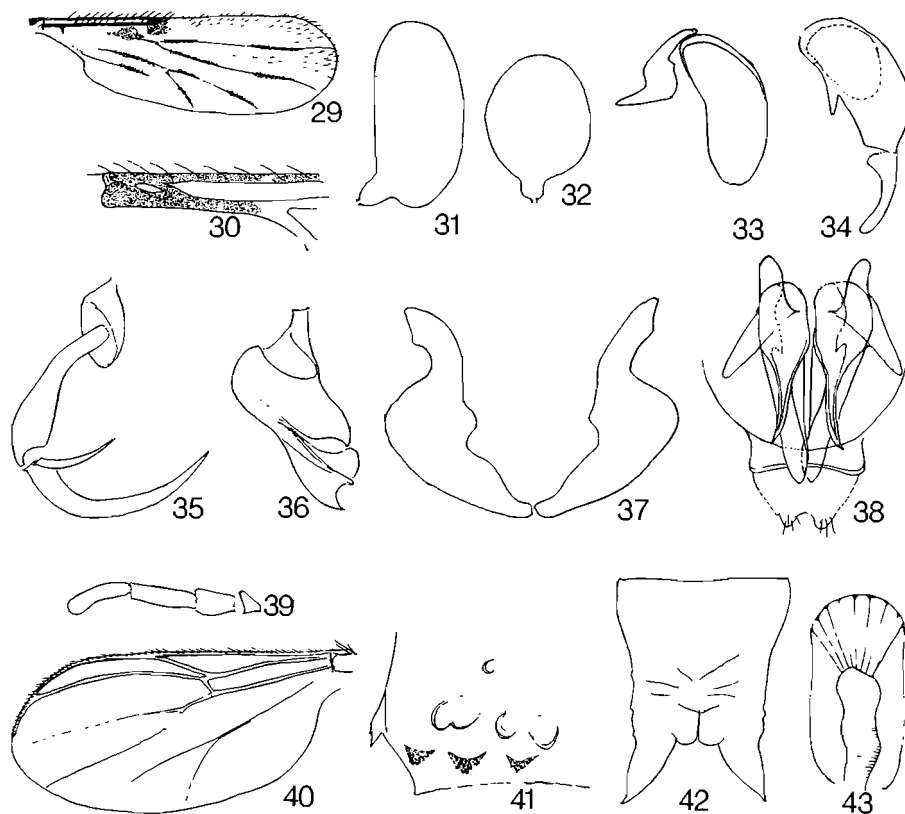
Holotype ♂. Wing length 0.75 mm. A small species with faintly spotted mesonotum, wing with two black spots and some infuscation of the veins as illustrated (Figs 29–30).

Head: Dark brown. Eyes with wedge-shaped separation; bare. Antenna with segments III–XII pale brown, XIII–XV darker; plume dark; distal three segments elongated, the proximal ones undifferentiated, each with a single row of verticils except III which has a long stalk and two rows of verticils; relative lengths of segments XII–XV, 10–30–25–25; antennal ratio 0,86. Palpus five-segmented; II–V of approximately same length and width, III not swollen, without sensory pit.

Thorax: Mesonotum brown with darker spots centered by a bristle; pleuron and postnotum brown; scutellum clear yellow with four long bristles and no smaller ones. Wing (Figs 29–30) transparent, veins except the costa poorly marked; with two small black spots, one at end of costa and the other over r–m crossvein, in addition some linear infuscations on the veins as shown in figure; microtrichia absent, macrotrichia few in number and largely confined to apex and anterodistal margin; a very small radial cell present at end of costa; costal ratio 0,45. Legs generally pale brown; all femora with ill-defined subapical pale band, mid and fore tibiae with such a band sub-basally; hind basitarsus darker than all other leg segments and with a row of closely set spines along its ventral side; a well marked sulcus or notch on dorsal side at base; hind tibia with apical row of five long spines and a subapical comb of 20 or more closely set smaller spines; fore tibia apically with a comb of closely set spines; none of tarsomeres anywhere with heavy short black spines commonly seen in members of the subfamily; fourth tarsomeres moderately cordate, fifth long and slender; claws on all legs short, stout and equal.

Abdomen: Proximal 2–3 segments pale, rest darkening to genitalia which are dark brown. Genitalia (Figs 33–34, 36–38) small but strongly formed, especially the aedeagus which consists of a pair of highly sclerotised plates, the apices of which are seen to project ventrally at right angles to abdomen; parameres consisting of two highly complicated plates the exact morphology of which could not clearly be determined in the available preparation but appearing as in Figs 36, 38; basistyle (Figs 33–34) small, longer than broad and carrying a large, triangular basal lobe internally; dististyle (Fig. 34) without any distinguishing features.

Female (allotype). Wing length 0,85 mm. As in the male, with usual sexual differences; perhaps a shade darker. Eyes as in male. Palpus as in male but segment III with a very shallow sensory pit situated on distal half. Antennal segment II very dark brown, rest pale brown darkening very slightly toward more distal segments; segments III–X gradually lengthening with no abrupt change in XI–XV; relative lengths of X–XV, 15–17–20–15–15–20; antennal ratio 0,88. Mandible with ten sharp well-formed teeth. Thorax as in male but a shade darker, scutellum clear yellow with four long bristles; mesonotum with slight rounded infuscations at the bases of the bristles. Wing as in male including absence of microtrichia and abundance of macrotrichia; the two dark spots and vein infuscations as in male; costal ratio 0,48, slightly greater than in male. Legs with pale and dark markings as in male, subapical pale band of fore tibia probably a little better defined; as in the male the hind basitarsus is darker than rest of leg, bearing a similar palisade of very closely set pale spines along its ventral side, but



Figs 29-38, *Alluaudomyia louisi*; 39-43, *Parabezzia stagni*: 29, male wing; 30, same, detail of radial cells; 31-32, female spermathecae; 33, male aedeagus and basistyle, lateral view; 34, male basistyle and dististyle, ventral view; 35, fourth and fifth tarsomeres and claws of female; 36, male paramere, lateral view; 37, aedeagus, ventral view; 38, parameres and apex of ninth tergum, ventral view; 39, female palpus; 40, female wing; 41, abdominal segment VII of pupa, left half, with rounded dorsal tubercles and pointed ventral tubercles (shown with shading from back side of specimen); 42, terminal segment of pupa; 43, pupal respiratory horn.

lacking the basal sulcus seen in the male; fourth tarsomere cordiform, fifth unarmed; claws of all legs unequal, as illustrated (Fig. 35). Abdomen with proximal segments paler than distal ones as in male. Two spermathecae (Fig. 31-32), strongly sclerotised, shapes unusual, the larger oblong with a pouch-like neck at the base of the duct which arises at the side at base, the smaller spermatheca shorter, more ovoid, with the neck arising symmetrically at base; measurements 0,074 by 0,038 mm and 0,056 by 0,038 mm; both spermathecae finely but clearly striated with 8-10 striae per 0,0125 mm.

Distribution. South Africa.

Types. Holotype ♂ (NM-2450), allotype ♀, 1 ♂ paratype, all from Sterkfontein, E. Louis Trichardt, N. Transvaal, 30-31.xii.1973, A. L. Dyce (no. 73.396), light trap.

Discussion. This species is named for Louis Trichardt, a pioneer of the northern Transvaal, who in 1837–8 made an epic oxwaggon trek from near the present town of Louis Trichardt, named for him, to Lourenço Marques (Maputo) where he and about half of his followers died of malaria.

A. louisi belongs to a group of about six Subsaharan species with two-spotted wings and two spermathecae. From all of these it differs markedly in both sexes; the short costa and unique genitalia immediately distinguish the male, while the peculiar spermathecae and short costa are enough to make the female immediately recognisable.

Genus *Parabezzia* Malloch

Parabezzia stagni sp. n. (Figs 39–43)

Holotype ♀. Wing length 1,0 mm; breadth 0,5 mm. Thorax, except scutellum which is paler, femora, tibiae and fifth tarsomeres dark brown; tarsomeres I to III or IV paler; wing unadorned, costa extending to near apex.

Head: Eyes widely separated in front; bare. Antenna with segments III–X each a shade paler on basal half; relative lengths of segments XI–XV, 40–40–40–40–55; antennal ratio 1,0. Palpus (Fig. 39) four-segmented; segment III not swollen to any degree, about as long as IV and without sensory pit.

Thorax: Mesonotum and postnotum very dark brown; pleuron slightly paler and scutellum definitely so. Wing (Fig. 40) unadorned and without macrotrichia. Costa reaching apex of wing and extending well beyond end of the single radial cell; no swelling at base; costal setae long, arising from near margin of vein. Halter very slightly infuscated. Tarsal claws long and slightly curved, moderately slender; very slightly unequal, the longer slightly shorter than tarsomere V on all legs.

Abdomen: Pale grayish brown, contrasting sharply with dark thorax and legs. Two spermathecae, dark brown, ovoid, with a small opening and no sclerotised neck; slightly unequal, measuring 0,069 by 0,053 mm and 0,063 by 0,050 mm.

Male. Unknown.

Pupa. Length 2,1 mm. Pale with short caudal processes and minute respiratory horn. Cephalothorax with numerous, colourless, rounded, unarmed protuberances dorsally; seta 1 could not be located, nor could the two setae usually found on the clypeal plate. Respiratory horn (Fig. 43) minute, measuring 0,075 by 0,050 mm; nine terminal spiracular openings. Operculum with two large unarmed tubercles; no setae nor spines. Abdomen (Fig. 41) with small, rounded, colourless, unarmed protuberances dorsally, these more triangular in shape ventrally but nowhere strongly modified, spine-like or armed. Segment IX (Fig. 42) with caudal processes short, stout, and pointed, bearing basally a belt of minute spines, some of which appear to be directed anteriorly.

Distribution. South Africa.

Type. Holotype ♀ (NM-2451) and associated pupal exuviae, Doornpan, Bulge River, N. Transvaal, 2.xi.1973, A. L. Dyce (no. 73.316), in ground water pool.

Discussion. Two species of *Parabezzia* have previously been described from the Subsaharan Region: *P. falcipennis* Clastrier (1960) described from a male, and *P. insolita* Vattier & Adam (1966), described from a female. Sexual dimorphism in this genus is dramatic as has been shown by Grogan & Wirth (1977), and it is difficult if not sometimes impossible to match the sexes specifically. The present species differs from *P. insolita* in a number of characters, the principal one being the presence of a marked swelling at the base of the costa in *insolita*; also the claws of the hindleg are unequal in *insolita*, whereas they are nearly equal in *stagni*; furthermore the spermathecae which are ovoid and nearly twice as long as wide in *insolita*, are subglobular and only slightly longer than wide in *stagni*. *P. falcipennis* has the basal costal swelling as in *insolita*, and indeed the two are possibly the male and female respectively of the same species. A comparison of types would be necessary to prove this synonymy. *P. stagni* belongs to the *uncinata* group of Grogan & Wirth (1977) where it comes closest to *P. bystraki* Grogan & Wirth, which has the scutellum dark. The species *Parabezzia stagni* takes its name from the Latin noun *stagnum*, a pool or swamp with standing water.

Genus *Kolenohalea* de Meillon & Wirth

Kolenohalea dycei de Meillon & Wirth

Kolenohalea dycei de Meillon & Wirth, 1981: 517

Distribution. South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Sterkfontein, E. Louis Trichardt, 30–31.xii.1973 (no. 73.396), light trap, holotype male.

Genus *Stilobezzia* Kieffer

Stilobezzia limnophila Ingram & Macfie (Figs 44–50)

Stilobezzia limnophila Ingram & Macfie, 1922: 267 (♂; Ghana; fig. genitalia); Macfie, 1932: 495 (notes on ♂; Nyasaland).

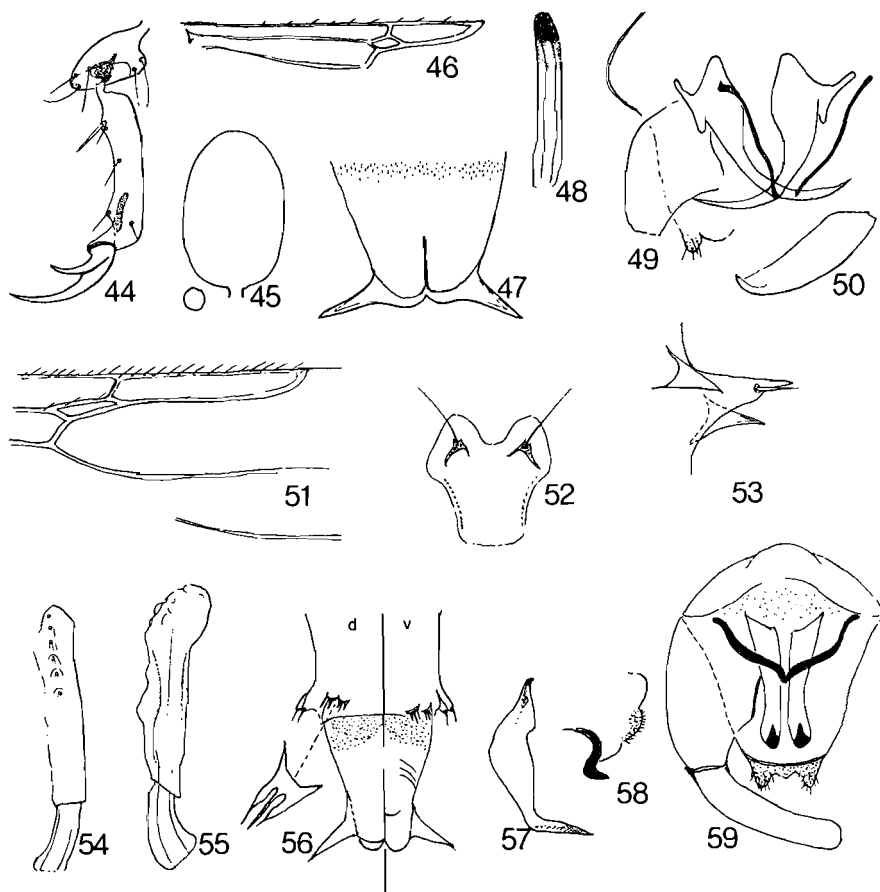
This species was previously known only from the male which was inadequately described. We take this opportunity to redescribe the male, add descriptions and figures of the female and pupa, and to present new South African records.

Male. Wing length 0.78 mm. A very small brownish insect with abdominal terga I–III yellowish and contrasting with the rest of the brown abdomen; wing and legs unornamented.

Head: Eyes separated by more than width of one ommatidial facet; bare. Antenna segment III barrel-shaped with two rows of verticils; with the exception of XIII–XV the flagellar segments not clearly separated from one another; relative lengths of XII–XV, 15–30–40–40; antennal ratio 0.90; XV without terminal seta. Palpus five-segmented; III not swollen, without sensory pit but with a few sensilla near apex, slightly shorter than IV+V which are subequal.

Thorax: Mesonotum, postnotum and pleuron dark brown; scutellum a shade paler with a pair of bristles close together at the middle and one on each side near lateral margin. Wing (Fig. 46) in both specimens diaphanous and poorly sup-

ported by weak, feebly sclerotised veins (it was necessary to use stain to determine the character of the radial veins and the length of the costa); two radial cells as figured; costal ratio 0,6; no trace of macrotrichia. Legs uniformly pale; hind basitarsus with double row of bulbous hairs, one reaching to apex and the other to about midlength; hind tarsomere II with double row of less closely set and well-developed bulbous hairs; hind tibia with an apical row of eight short spines and a subapical comb of about 20 short, closely set, poorly defined spines; apex of fore tibia with a comb of rather long, transparent, closely set spines which defied counting; tarsomere IV cordiform on all legs; V longer than IV, cylindrical, unarmed; claws small, simple or minutely split apically; no strong black spines on any segments of the legs.



Figs 44-59, *Stilobezzia* species; 44-50, *S. limnophila*; 51-59, *S. orientis*: 44, fourth and fifth tarsomeres of female foreleg; 45, female spermathecae; 46, detail of radial cells of male wing; 48, 54, pupal respiratory horn, posterior view; 55, same, ventral view; 47, terminal abdominal segment of male pupa, ventral view; 49, male genitalia, with dissection of aedeagus and parameres; 50, male dististyle; 51, details of radial cells of female wing; 52, pupal operculum; 53, lateral tubercles of abdominal segment VI of pupa; 56, abdominal segments VIII and IX, dorsal view left, ventral view on right, with detail of dorsal tubercles; 57, male paramere and 58, male aedeagus, lateral view; 59, male genitalia, ventral view.

Abdomen: Brown except for venter and the whole of segments I–III which are yellowish. Genitalia (Fig. 49) in general structure much like those of a number of small African species with unarmed legs; closely resembling those of *S. simulator* de Meillon from Liberia, differing in the precise shape of the parameres, aedeagus and dististyle. Ninth segment sclerotised in contrast to rest of abdomen, sternum with shallow excavation; aedeagus triangular, largely membranous with narrow sclerotised margins; dististyle (Fig. 50) short, broad, parallel sided and ending in a beak-like apex.

Female. Wing length 0,9 mm. General coloration as in male. Eyes separated as in male, bare. Antenna segments III–X pale, XI–XV darker; relative lengths of segments XI–XV, 30–30–30–30–45; antennal ratio 1,35. Palpus with relative lengths of segments II–V, 20–30–22–32. Thorax as in male including setation of scutellum. Wing as in male; veins poorly marked, macrotrichia absent; radial cells as figured; costal ratio 0,6. Legs with setation and modified hairs on tarsi as in male; tarsomeres IV and V as in male; claws unequal on all legs (Fig. 44), the shorter claw fused to base of longer and appearing as a single claw with a basal tooth as in other species of the genus. Abdomen pale throughout, without any darkening of distal segments. Two spermathecae (Fig. 45); larger dark brown, oblong with short neck, measuring 0,063 by 0,038 mm, the other an exceedingly small spherical body (diameter 0,009 mm).

Pupa. Length 1,8 mm. Colour pale brown, respiratory horn darkened apically. Cephalothorax without noteworthy tubercles, spines or setae. Respiratory horn (Fig. 48) 0,15 mm long, narrow, parallel sided to the apex which bears 5–6 spiracular openings in fanlike manner; operculum with a pair of small tubercles and many pigmented bosses. Abdominal segments I and II devoid of any marked tubercles or setae; III–VIII each with small ventral and dorsal tubercles sometimes bearing small spines, and rather prominent tubercles with apical spines laterally or dorsolaterally; the character of these abdominal spines and tubercles much as in other members of the *Stilobezziini*. Segment IX (Fig. 47) with prominent terminal processes projecting at near right angles to main axis of abdomen; basally with a narrow belt of minute, forwardly directed spines as figured.

Distribution. Ghana, South Africa.

Material examined. SOUTH AFRICA: *Transvaal.* Jam Tin Creek, Malelane, 2.xii.1973 (no. 73.357), from margins of running stream, 2 ♂. Burgershall, Hazyview, 3.xii.1973 (no. 73.361), margin of water storage dam, 1 ♀. Sterkrivier Rd. SW Potgietersrus, 3.i.1974 (no. 74.108), roadside seepage bank, 1 ♂ 1 ♀. All with associated pupal exuviae.

***Stilobezzia orientis* sp. n. (Figs 51–59)**

Male. Wing length 1,2 mm. Described from the holotype and one paratype. A uniformly brown species with scutellum and legs a shade paler.

Head: Pale brown; eyes separated by a wedge-shaped space which at its narrowest slightly exceeds diameter of one ommatidial facet; bare. Antennal third segment with long stalk and two rows of verticils; IV–XII each with a single row of

verticils; relative lengths of XII–XV, 20–50–70–60; antennal ratio 1,12. Palpus with second segment only slightly shorter than third which is longer than IV but shorter than V; III not swollen, with a small shallow sensory pit present near tip.

Thorax: Uniformly brown with paler scutellum. Wing (Fig. 51) unornamented; microtrichia dense, a few macrotrichia present apically; second radial cell about three times as long as first; costal ratio 0,75; fringe complete; alula bare. Legs uniformly pale brown; all femora unarmed; hind tibia with row of long bristles apically and a subapical comb of closely set transparent spines; fore tibia with comb of small teeth subapically; hind basitarsus strong, with double row of bulbous hairs running the length of segment; no black spines or strongly modified setae on the other leg segments. Claws small, equal and simple.

Abdomen: Pale brown dorsally much as thorax, venter paler. Genitalia (Figs 57–59) of the type seen in many species of this genus; not heavily sclerotised except for lateral sclerites of aedeagus which are black; basistyle short and broad, not extending beyond ninth tergum; dististyle pale, stout and not tapered to tip, which is bluntly rounded; aedeagus a simple triangle with two slender black lateral sclerites joined by a transparent membrane; parameres divided, each forming a broad sclerite with distal third bent ventrally at right angles and narrowing to a sharp point, best seen in side view (Fig. 57).

Female. Unknown.

Pupa (Figs 52–56). Length 4,0 mm. Pale brown with cephalothorax slightly darker; without any prominent tubercles but with fairly long setae on dorsum of cephalothorax. Respiratory horn (Figs 54, 55) borne on a distinct slender peduncle; slightly curved with dorsal margin slightly irregular in lateral view (Fig. 55); six small widely spaced spiracular openings on distal half, difficult to see except in edge view (Fig. 54). Operculum (Fig. 52) with a pair of strong tubercles on distal half, each bearing a long seta. Abdomen (Fig. 56) with rather small tubercles laterally and bifid or trifid spines dorsally and ventrally; caudal processes of ninth segment sharply pointed and directed at right angles (or nearly so) to longitudinal axis of abdomen.

Distribution. South Africa.

Types. Holotype ♂ (NM-2452), 1 ♂ paratype, Burgershall Tropical Fruit Res. Station, Hazyview, E. Transvaal, 3.xii.1973, A. L. Dyce (no. 73.361), margins of a water storage dam.

Discussion. The genitalia remind one somewhat of those of *vandeli* Vattier & Adam from the Congo (Brazzaville), but the aedeagus and dististyle are sufficiently different to readily separate the species.

Genus *Homohalea* Kieffer

In the genus *Homohalea* the wing has two radial cells, the costa extending nearly to the wing tip; femora armed ventrally with stout spines; tarsal claws of female equal on all legs, each claw gently curved and on foreleg bearing a slender internal sub-basal barb; fifth tarsomeres of female with 1–2 pairs of ventral batonnets; eyes contiguous or nearly so; two spermathecae present.

Six Subsaharan species have been described:

- delanoe* (de Meillon), 1942: 113 (*Palpomyia*). Zimbabwe (♂).
diabolus (de Meillon), 1961: 51 (*Spaeromias*). Madagascar (♀).
longicosta (Goetghebuer), 1933: 150 (*Palpomyia*). Zaire (♀).
melia de Meillon, 1943: 112. Zimbabwe (♀).
stuckenbergi (de Meillon), 1961: 51 (*Spaeromias*). Madagascar (♀).
telmatoscopa (Ingram & Macfie), 1921: 353 (*Schizodactylus*). Ghana (♂, ♀, pupa).

Key to the Subsaharan species of *Homohoelea* (females)

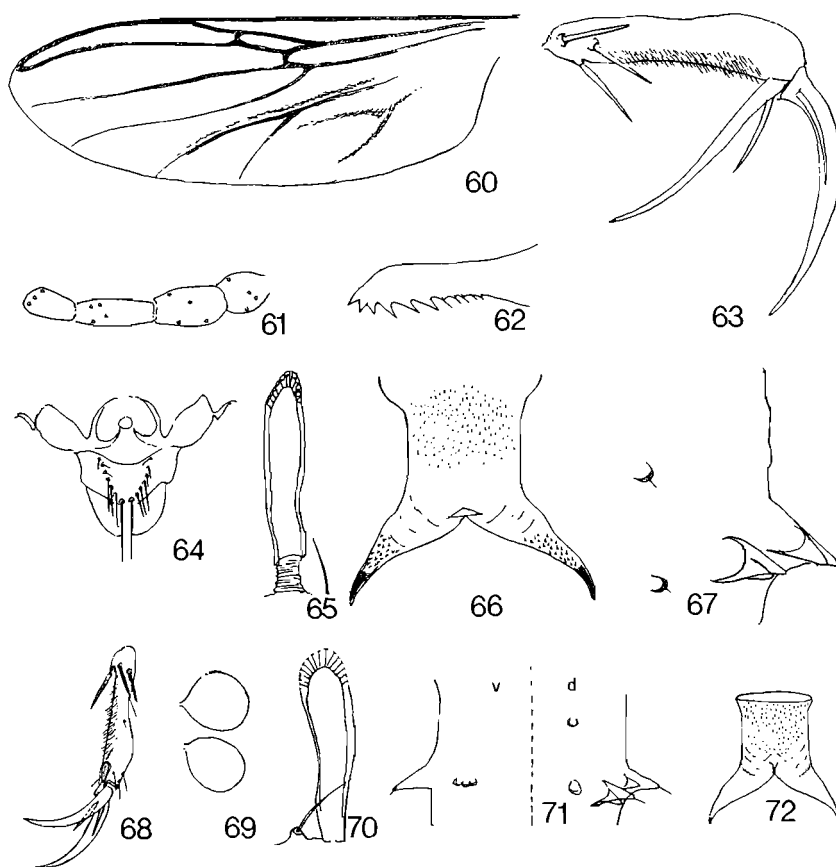
- 1 Fifth tarsomere with 4 or fewer batonnets, these placed near base of segment; only foreleg claws with inner basal tooth (*Homohoelea*) 2
- Fifth tarsomere with more batonnets and these more spread out over length of segment; all claws with inner basal tooth Genus *Sphaeromias*
- 2 Small species, wing length less than 2,0 mm; mid and hind femora each with about 12 spines **telmatoscopa** (Ingram & Macfie)
- Larger species, wing length 2,0 mm or more; mid and hind femora with 4–6 spines 3
- 3 Wing length over 3,0 mm; mesonotum and abdomen ornamented; fore femur with 9 spines; only one talon of fore claws barbed **stuckenbergi** (de Meillon)
- Wing length 2,0–2,9 mm; mesonotum uniformly brown; fore femur with 4–6 spines; both talons of fore claws barbed 4
- 4 Wing length 2,86 mm; femoral spines 6, 8–9, and 5 **melia** de Meillon
- Wing length 2,0–2,5 mm; femoral spines otherwise 5
- 5 Wing length 2,0 mm; (third palpal segment equal in length to fourth and fifth combined; antennal ratio 1,52; femoral spines 4–5, 4 and 4) **diabolus** (de Meillon)
- Wing length 2,5 mm 6
- 6 Third palpal segment equal in length to fourth; antennal ratio 1,10; femoral spines 6, 8 and 9 **albitudinis** sp. n.
- Third palpal segment 1,3 times as long as IV, 0,67 as long as IV and V combined; antennal ratio 1,35; femoral spines 6, 6 and 6 **delanoe** (de Meillon)

***Homohoelea albitudinis* sp. n.** (Figs 60–67)

Holotype ♀. Wing length 2,5 mm.

Head: Eyes closely approximated in front; bare. Antenna with lengths of segments XI–XV in proportion of 50–50–50–50–55; antennal ratio 1,10; segments III–X with long, sharply pointed, hyaline sensilla trichodea; all segments of flagellum narrowly pale basally. Palpus (Fig. 61) five-segmented; about as long as proboscis; third segment slightly expanded, without sensory pit and subequal in length to fourth. Mandible (Fig. 62) with six large apical teeth preceded by six smaller subapical ones.

Thorax: Mesonotum, pleuron, scutellum and postnotum dark brown; scutellum with a number of small delicate hairs scattered irregularly. Wing (Fig. 60) with two radial cells, second nearly attaining tip of wing and about three times length of first; costal and radial veins strong, others weak; macrotrichia absent, no pattern of ornamentation; anal angle quite large. Legs (Fig. 63): Femora, tibiae and fifth tarsomeres dark brown; first four tarsomeres much paler except at extreme apices; all femora slightly enlarged and armed with short, black, rather bluntly pointed ventral spines as follows; foreleg 6, midleg 8, and hindleg 9; apex of hind tibia without strong hyaline spine apically, but with apical comb of about 10 long, strong bristles and a dense patch of shorter setae subapically; hind basitarsus with double row of bulbous hairs; hind second tarsomere with single row of such hairs; basitarsus and second tarsomere of midleg each with single row of bulbous hairs; tarsomeres of foreleg without such hairs; all fifth tarsomeres



Figs 60-72, *Homohela* species; 60-67, *H. albituainis*; 68-72, *H. delanoë*: 60, female wing; 61, female palpus; 62, female mandible; 63, 68, female fifth tarsomere and claws of foreleg; 64, female genital sclerotisation; 65, 70, pupal respiratory horn; 66, 72, ninth abdominal segment of female pupa; 67, dorsal view of posterior portion of abdominal segment VII of pupa; 69, female spermatheca; 71, dorsal view right, and ventral view left, of tubercles on abdominal segment VI of pupa.

provided proximally with batonnets, foreleg with 3, midleg with 4, and hindleg with 4; claws long and equal on all legs; those on foreleg each with slender inner tooth, others without inner tooth; plantar surface of fifth tarsomere of foreleg densely covered with minute erect hairs.

Abdomen: All white with slight infuscation laterally; genital sclerotisation as in Fig. 64. Two spermathecae; dark, ovoid with small opening and no sclerotised neck; the larger measuring 0,130 by 0,090 mm, the other slightly smaller.

Male. Unknown.

Pupa. Dark brown throughout, the cuticle, especially of the cephalothorax, liberally supplied with small dark bosses. Respiratory horn (Fig. 65) dark brown matching cephalothorax in color, parallel sided, somewhat narrower at apex where it bears 12 respiratory openings; the organ is unique in that about 0,05 mm of its base is exposed with the trachea showing as figured. Seta 1 a strong hair; apart from seta 1 the cephalothorax is devoid of any setae, hairs or tubercles of any size. Abdomen (Fig. 67) with some prominent tubercles but no strong setae, spines or hairs; ninth segment (Fig. 66) with a pair of strong, divergent, caudal processes with spine-like apices; integument of segments 8 and 9 with minute spines.

Distribution. South Africa.

Type. Holotype ♀ (NM-2453), with associated pupal exuviae, Doornpan, Bulge River, N. Transvaal, R.S.A., 6.xi.1973, A. L. Dyce (no. 73.316), in ground water pool.

Discussion. This species comes near *diabolus* (de Meillon) from Madagascar, differing in many details as follows: larger, wing length 2,0 mm in *diabolus*; abdomen dead white and not only a shade paler than thorax; third palpal segment equal in length to fourth and not to four plus five; antennal ratio 1,10 compared with 1,35; femoral spines on fore, mid, and hind femora total 6, 8 and 9 compared with 4-5, 4 and 4. There is little doubt that we are dealing with two different species.

Homohalea delanoe (de Meillon), **comb. n.** (Figs 68-72)

Palpomyia delanoe de Meillon, 1942a: 113 (male; Rhodesia; fig. genitalia).

Originally described from a single male under the genus *Palpomyia*. The discovery of further males and females allows us to describe the latter and also the pupa.

Female. Wing length 2,5 mm. Whole of the thorax, tibiae and fifth tarsomeres dark brown to black; abdomen and tarsomeres I-IV very pale yellow.

Head: Eyes very narrowly separated in front, bare. Antenna dark brown, segments IV-X slightly paler basally and not compressed as in the male; segments X-XV with lengths, 30-60-55-55-60-65; antennal ratio 1,35. Palpus pale, nearly as long as proboscis; segments with lengths as 10-15-20-15-15; III parallel sided, without sensory pit. Mandible with 6-7 large teeth and several smaller ones.

Thorax: Mesonotum thinly clad with scattered, mostly short, fine setae; a few heavier bristles laterally above wing base; pleuron without bristles or setae. Wing typical of the genus with costa reaching to near apex; media broadly sessile; second radial cell nearly four times length of first; none of the veins particularly strongly developed; microtrichia minute and dense, macrotrichia absent. Legs with femora and tibiae dark brown; fifth tarsomeres infuscated, tarsomeres II–IV white or pale yellow; femora armed with short, stout, black spines as follows: foreleg 6–7, midleg 4–7, hindleg 4–8; fore tibia apically with comb of numerous, closely set, transparent spines and a long sinuous transparent spur; hind tibia with a row of ten long spines apically and a comb of numerous transparent teeth subapically; mid tibia with a single dark spine at tip; hind basitarsus with a double row of bulbous hairs; mid basitarsus with a single row of such hairs and one or two dark spines apically; hind tarsomere II with a single row of bulbous hairs; mid tarsomere II with a row of dark spines apically; tarsomere IV short but not definitely cordiform; tarsomere V of all legs infuscated, long and slender, armed ventrally at base with batonnets as follows: foreleg 3, midleg 4, hindleg 4 (these numbers constant in 18 legs of 3 specimens); claws long, slender and equal on all legs, on foreleg (Fig. 68) each talon with a slender, short, gently curved, sharply pointed barb internally near base; on other legs the claws are simple.

Abdomen: White or pale yellow but slightly darker laterally in alcohol-preserved specimens and much paler than thorax. Genital sclerotisations not well-developed. Two spermathecae (Fig. 69), dark brown, ovoid; measuring 0,125 by 0,094 mm and 0,106 by 0,066 mm; mouth narrow and neck not sclerotised.

Male. The four males have the genitalia exactly as in the original description of *H. delanoe*; they also agree in other characters including wing and costal length, the very short palpus and antenna, antennal ratio and relative lengths of segments, colour, and other details. Some variation (with means in brackets) in number of spines on femora is apparent in the 24 legs of the four specimens as follows: fore femur 2–4 (3,0), midfemur 1–3 (1,75), hindfemur 1–3 (2,25); in the original description these figures are given as 1–2, 0–1, and 2,2.

Pupa. Length 6,0 mm. Dark brown and with shagreen throughout. Cephalothorax with dorsal setae fairly long, thin and not borne on prominent tubercles. Respiratory horn (Fig. 70) 0,35 mm long in female and slightly less in male, rather slender, rounded apically where it bears about 14 spiracular openings arranged as in a fan. Operculum with a pair of small tubercles each bearing a slender hair. Abdomen with some minute stiff setae and no tubercles on segments I and II; segments III–VIII (Fig. 71) with large triangular tubercles, especially laterally, as shown, no strong or long setae anywhere; segment IX (Fig. 72) with divergent, sharp-pointed caudal processes and largely covered with minute spicules.

Distribution. Zimbabwe, South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Zoutpan, near Onderstepoort, 10.i.1974, (no. 74.109), from a grassy vlei (marsh), brack, 4 ♂ 3 ♀, with pupal exuviae.

Genus *Jenkinshelea* Macfie*Jenkinshelea rhodesiensis* de Meillon

Jenkinshelea rhodesiensis de Meillon, 1937b: 261 (♀; Rhodesia; fig. wing); de Meillon, 1942b: 23 (Mozambique; ♀ bred from pupa in Incomati River); de Meillon, 1943: 109 (♂; Rhodesia; figs).

Distribution. Zimbabwe, Mozambique, South Africa, Ivory Coast.

Material examined. IVORY COAST: 25 km N Bouake, 27.x.1971, J. A. Gruwell, light trap, 1 ♀ (U.S. National Museum). SOUTH AFRICA: *Transvaal*. Sand River between White River and Hazyview, 2.xii.1973 (no. 73.358), reared from stream margins, 1 ♂ with pupal exuviae.

Remarks. The presence of only one radial cell in the wing will separate this species from *J. accraensis* (Ingram & Macfie) from Ghana, *J. corea* de Meillon from Zimbabwe, and *J. polyxena* de Meillon from Zululand.

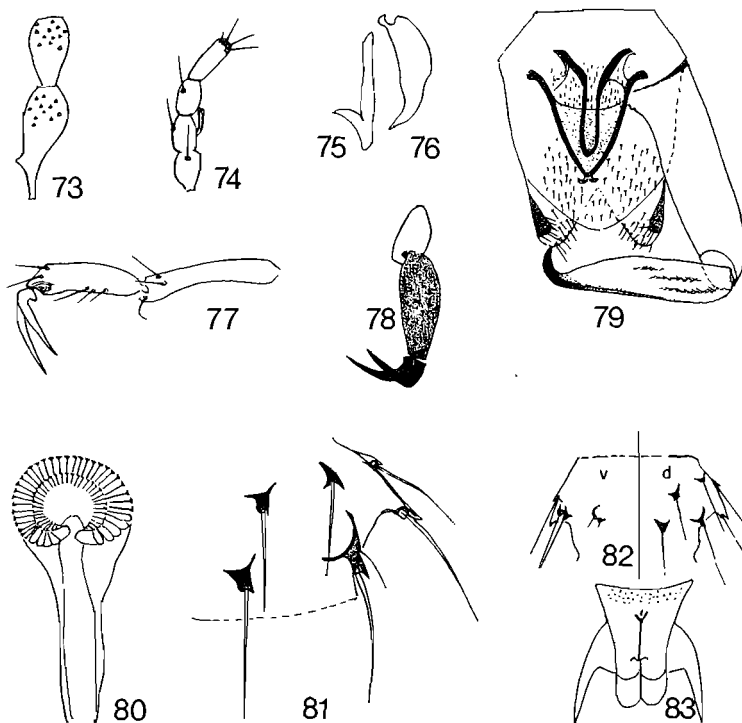
Genus *Macropeza* Meigen*Macropeza geari* sp. n. (Figs 73–83)

A dark brown species with pale legs except for fifth tarsomere of foreleg which is black and slightly swollen; apices of hind femur and tibia a shade darker; head of pupal respiratory horn rosettelike. Known only from the holotype male with associate pupal exuviae.

Holotype ♂. Wing length 1,2 mm.

Head: Dark brown. Eyes widely separated, bare. Proboscis short. Face and clypeus with one or two weak bristles. Antenna (Fig. 73) long, segments III–XV combined measuring 0,9 mm; verticils not dense, largely colourless and with their bases scattered and not arranged in a row around the segment (as shown in figure); III uniformly dark, IV–XV slightly paler basally; relative lengths of XI–XV, 20–30–34–60–60; antennal ratio 1,0. Palpus (Fig. 74) small, hardly longer than proboscis; segments II–IV subequal or nearly so, V longer and more slender; III with a few sensilla but no sensory pit; the whole poorly supplied with setae.

Thorax: Very dark, almost black throughout. Mesonotum without anterior spine or large setae; densely pubescent dorsally. Laterally on mesonotum and extending onto pleuron downy pubescence replaced by minute spinules. Scutellum with a few short slender setae. Wing unicolorous, veins except radius and costa feebly developed and difficult to see in preparation; microtrichia minute, macrotrichia absent; radial cell long and narrow; costal ratio 0,75; anal angle developed but not excessively so; crossvein nearly perpendicular to costa, media apparently broadly sessile. Legs markedly paler than thorax; apices of hind femur and tibia infuscated but not sharply so; in addition fifth tarsomere of foreleg (Fig. 78) definitely infuscated and swollen; fore tibia with apical row of about 12 long bristles and a very long hyaline spur; hind tibia with an apical row of five bristles of which the central one is the longest and strongest, subapically an oblique comb of about 15 closely set spines, an apical spur could not be detected; hind basitarsus with a single row of bulbous hairs which reach to within 0,3 of apex; all other leg segments unarmed; fourth tarsomere on fore (Fig. 78) and midlegs more



Figs 73-83, *Macropeza gearii* male: 73, antenna, segments III and IV; 74, palpus; 75, paramere, and 76, aedeagus, lateral view; 77, tarsomeres IV and V of hindleg; 78, same, foreleg; 79, genitalia, ventral view; 80, pupal respiratory horn; 81, abdominal segment IV of pupa, tubercles of right side, dorsal view; 82, tubercles of abdominal segment VII of pupa, dorsal side right, ventral left; 83, abdominal segment IX of pupa.

or less cordiform, on hindleg (Fig. 77) elongated and longer than fifth tarsomere; tarsomere V of hind (Fig. 77) and midlegs slender and slightly infuscated; claws of all legs equal and simple and rather large for a male. Relative lengths of leg segments:

Leg	Femur	Tibia	Tarsomeres				
			I	II	III	IV	V
I	18,0	13,0	6,0	2,5	2,0	2,0	3,5
II	23,0	19,0	9,0	3,0	2,0	1,5	3,0
III	24,0	26,0	18,0	10,0	6,0	4,0	3,0

Abdomen: Dark brown. Genitalia (Fig. 79) of the type seen in this genus; basistyle just over three times as long as wide without any strong bristles; dististyle long and narrowed apically to a strong sclerotised hook. Parameres (Fig. 75) consisting of two narrow sclerites joined apically; aedeagus triangular, the sides sclerotised, the apex bearing a pair of unpigmented, ventrally produced lobes best seen in side view (Fig. 76).

Female. Unknown.

Pupa. Length 2,7 mm. Colour uniformly dark brown. Cephalothorax without any pronounced or enlarged tubercles or shagreen, the dorsal setae long and slender; opercular setae minute and delicate; two pairs of strong clypeal setae of which the inner is the longer, measuring about 0,14 mm. Respiratory horn (Fig. 80) unique, like a rosette with the expanded circular head measuring 0,09 mm in diameter and the total length of the organ 0,2 mm; nearly 40 spiracular openings arranged around the head in a circle. Abdomen with five long, thin, mostly straight setae and one short one, none mounted on tubercles on segment I; segments II–VIII (Figs 81–82) with small but pronounced dark tubercles which contrast strongly with the paler brown of the integument, these tubercles mostly bear straight stiff setae of which those on the medial pair of tubercles nearly reach the base of the next segment; laterally the setae tend to be curved, especially those on segments III–V; lateroventrally is a tubercle as on dorsal surface but smaller, followed by a long thin hair without a basal tubercle and then a somewhat flat, partially divided tubercle, each division of which bears a stiff, strong seta of which the outer is the longer. Segment IX (Fig. 83) with unusual configuration; without hairs, setae or even the usual finely pointed spinules, though basally there is a narrow belt of minute bosses.

Distribution. South Africa.

Type. Holotype ♂ (NM-2454) with associated pupal exuviae, Burgershall Tropical Fruit Res. Station, Hazyview, E. Transvaal, 3.xii.1973, A. L. Dyce (no. 73.361), margins of a water storage dam.

Discussion. The species is named for Dr James Gear, pathologist, virologist, and specialist in tropical medicine, who while director of the South African Institute for Medical Research strongly supported the Department of Medical Entomology enabling it to maintain its international status.

The male genitalia and pupa of *M. geari* differ from those of all other species in which at least one of these stages is known. Wirth & Ratanaworabhan (1972) gave an up-to-date diagnosis of the genus and a check-list of the species of the world. Of the 17 valid known species of the genus 12 occur in Sub-Saharan Africa. Of these the pupae have been described only of *M. bayeri* (de Meillon) and *natalensis* (de Meillon) (de Meillon, 1937a). The males are known only for *bayeri*, *fluviatilis* (de Meillon, 1940), and *natalensis*. It is indeed possible that *M. geari* may represent the male of one of the nine other species presently known only from females.

Genus *Mallochohelea* Wirth

Mallochohelea errinae (de Meillon)

Palpomyia errinae de Meillon, 1940: 461 (male; Transvaal; figs).

Mallochohelea errinae (de Meillon); Wirth, 1962: 279 (combination).

Distribution. South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Magaliesberg Agric. School, 13.xi.1973 (no. 73.340), reared from stream margin, 1 ♂ with pupal exuviae.

Remarks. The holotype of *M. errinae* and the only previously known specimen was reared by de Meillon in 1939 from a pupa collected in the Jukskei River, Johannesburg.

Mallochohelea sanctaeluciae (de Meillon), **comb. n.***Palpomyia sanctaeluciae* de Meillon, 1937a: 365 (male; Zululand; figs).

Distribution. South Africa.

Remarks. Although only the male of this species is known, the following characters given in the original description characterise it as a species of *Mallochohelea*, and take it out of *Palpomyia*: femoral spines lacking; fourth tarsomeres cylindrical, not cordiform; and parameres fused basally. The species is easily recognisable by the presence of a dark spot in cell R5 just below the end of the costa. De Meillon (1940) stated that the species was closely related to *M. errinae*.

***Mallochohelea fluminea* sp. n. (Figs 84–88)**

Holotype ♀. Wing length 2,65 mm. A large species uniformly dark except for tarsomeres I–III which are markedly paler.

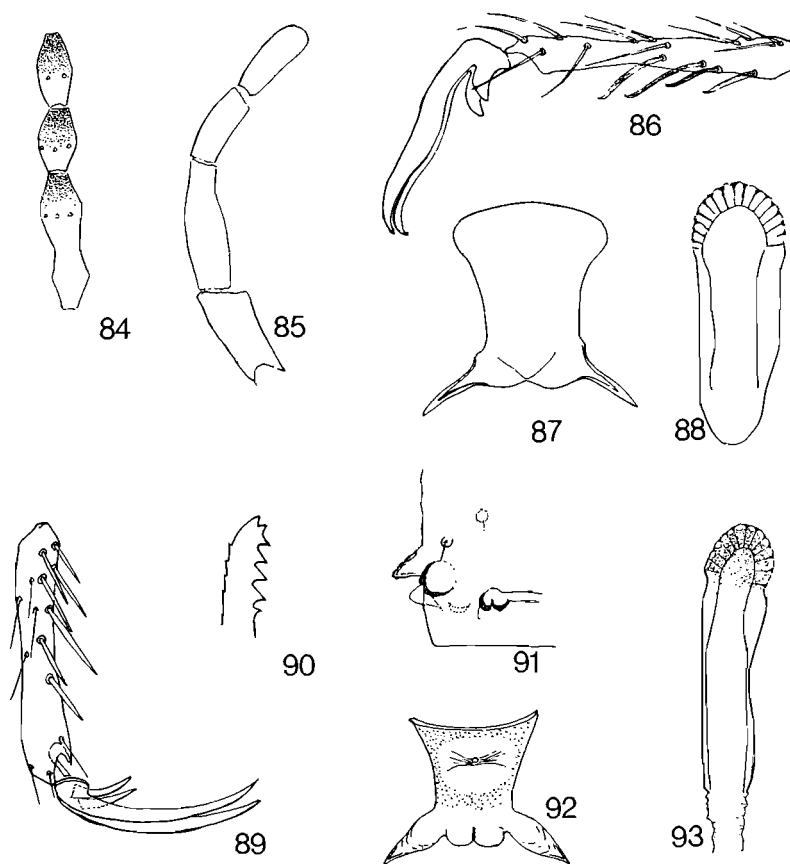
Head: Very dark brown. Antenna (Fig. 84) with segments 3–10 darker apically, barrel shaped; 11–15 elongated, parallel sided, dark brown; antennal ratio 1,70; segments XI–XV with lengths in proportion of 65–65–60–65–110. Palpus (Fig. 85) five-segmented; third segment not swollen, without a sensory pit and slightly shorter than IV+V combined; second segment longer than usual.

Thorax: Uniformly dark brown and strongly sclerotised; anteriorly with a prominent median spine. Wing slightly infuscated, bare, with costal and radial veins strong and dark; anal lobe not enlarged; first radial cell length 0,23 mm, second 0,80 mm; costal ratio 0,79. Legs (Fig. 86) with femora, tibiae and tarsomeres IV and V dark brown; tarsomeres I–III much paler; femora slightly swollen on distal half and ventrally armed with strong, sharply pointed black spines as follows: a row of 9–10 on foreleg (one leg has in addition a single larger black spine situated about $\frac{2}{3}$ from base); 3–5 strong, pointed, black spines on midleg; a row of 5–6 toward apex of hind femur. Fore tibia with apical comb of 8 or more closely set spines; hind tibia with apical comb of 7 strong spines; mid basitarsus with single row of palisade setae running length of tarsomere; hind basitarsus with double row of such setae; fourth tarsomeres not cordiform; fifth tarsomeres on all legs cylindrical and much longer than IV and slightly longer than III; each provided with four pairs of batonnets on proximal half of tarsomere; claws long and equal on all legs, each with a large external thumb-like basal tooth.

Abdomen: Dark brown. Two ovoid, large, dark spermathecae measuring 0,150 by 0,106 mm and 0,125 by 0,081 mm; opening small and no sclerotised neck.

Male. Unknown.

Pupa. Dark brown and typical of Sphaeromiini. Operculum with many small bosses and four tubercles, the anterior pair each with a fairly long delicate hair; rest of cephalothorax with a few tubercles anteriorly near respiratory horn, and some minute hairs dorsally near midline. Respiratory horn (Fig. 88) measuring 0,20 mm in length and 0,075 in greatest width; apex evenly rounded and bearing 16–18 spiracular openings arranged as in a fan. Abdominal segments III–VIII dorsally each with an anterior pair or small tubercles bearing a delicate hair, and



Figs 84-88, *Mallochohelea fluminea*; 89-93, *Sphaeromias theileri*: 84, segments III-V of female antenna; 85, female palpus; 86-89, fifth tarsomere and claws of female; 87, 92, ninth abdominal segment of pupa; 88, 93, pupal respiratory horn; 90, female mandible; 91, tubercles of abdominal segment VII of pupa; 92, abdominal segment IX of pupa.

a similar pair posteriorly; laterally on each side are three small but sharp and strong hyaline hooks; ventrally no armature of note. Ninth segment (Fig. 87) without any setae; caudal processes nearly at right angles to body, tips with strong hyaline spine.

Distribution. South Africa.

Types. Holotype ♀ (NM-2455) with pupal exuviae, Sand River between White River and Hazyview, E. Transvaal, 2.xii.1973, A. L. Dyce (no. 73.358), stream margin. 1 ♀ paratype, Burgershall, Tropical Fruit Res. Station, Hazyview, 3.xii.1973, A. L. Dyce (no. 73.361), margin of water storage dam.

Note: The second female agrees with the holotype except in the number of black spines on the femora as follows: 6 on foreleg, 4 on midleg and 4 on hindleg; the pupal respiratory organ has up to 20 spiracular openings.

Discussion. This species can be separated from the other described Subsaharan *Mallochohelea* by the following key.

Key to Subsaharan species of *Mallochohelea*

- 1 Femora unspined 2
- Femora with strong ventral spines, at least on forelegs 5
- 2 Thorax shiny black to dark brown; legs various 3
- Thorax shiny translucent brownish; legs yellowish, knees narrowly black and tarsomeres IV and V black; 4–5 pairs of batonnets on all legs; wing length 2,0 mm (Cape Province) **sidis** (de Meillon)
- 3 Male (Transvaal) **errinae** (de Meillon)
- Female 5
- 4 Wing length 3,3 mm; legs brown; 6 pairs of batonnets; claw with blunt basal tooth (Cape Province) **turneri** (Ingram & Macfie)
- Wing length 2,5 mm; femora dark brown, paler on distal half of hind pair; tibiae yellowish, dark brown on basal half on hindleg; 4 pairs of colourless batonnets; basal tooth of claw long and slender (Mozambique) **luaboensis** (de Meillon)
- 5 All femora armed ventrally 6
- Fore femur armed ventrally with 3–4 spines, mid and hind pairs unarmed (Madagascar) **siricis** (de Meillon)
- 6 Wing length 4,5 mm; femoral spines 10, 7 and 2; 6 pairs of batonnets (Kenya) **kirki** (Macfie)
- Wing length 2,65 mm; femoral spines 9–10, 3–5 and 5–6; 4 pairs of batonnets (Transvaal) **fluminea** sp. n.

Genus *Nilobezzia* Kieffer*Nilobezzia robusta* (de Meillon)

Bezzia robusta de Meillon, 1937a: 346 (♂; Zululand; figs); de Meillon, 1942b: 19 (in key).
Nilobezzia capensis de Meillon & Hardy, 1954: 70 (♀, ♂; Cape Prov; figs).

Distribution. South Africa.

Material examined. SOUTH AFRICA: *Cape Province*. 10 mi NE Douglas, 23.i.1974 (no. 74.146), rainwater pool, 1 ♀ with pupal exuviae.

Genus *Sphaeromias* Curtis*Sphaeromias theileri* sp. n. (Figs 89–93)

Described from the holotype, a partially emerged, mature female, dissected from its pupal exuviae.

Holotype ♀. Wing length 1,95 mm. A dark brown species with paler legs but fifth tarsomeres infuscated.

Head: Dark brown. Eyes very closely approximated, bare. Antenna dark brown throughout; relative lengths of segments X–XV, 20–38–40–40–40–45; antennal ratio 1,45. Palpus barely as long as proboscis; relative lengths of segments II–V, 30–40–24–20; third segment slender, parallel sided, without sensory pit but with a few sensilla near mediodistal corner. Mandible (Fig. 90) with seven large teeth medially and four much smaller ones on lateral margin.

Thorax: Mesonotum dark brown with four strong bristles above wing root, otherwise provided only with small delicate hairs; scutellum dark brown, with six strong bristles and a few small delicate hairs; postnotum dark brown; pleuron dark brown, bare. Wing in poor condition because of dissection from teneral specimen, when stained seen to have one radial cell and costal ratio of 0,76; no signs of macrotrichia or adornment. Legs badly curled, nevertheless structure could be determined; femora, tibiae and fifth tarsomeres of all legs brown, rest paler; femora armed with a single apical sharp-pointed, dark spine on each leg; fore tibia with a long slender hyaline spur and a comb of densely set transparent teeth apically; hind tibia with a very small spur and a row of seven strong spines apically, subapically a dense comb of short teeth which could not be counted; hind basitarsus with double row of bulbous hairs which run the length of tarsomere; hind tarsomere II with a single row of such hairs; fourth tarsomeres very short and probably cordate; fifth tarsomeres (Fig. 89) on all legs very long, dark and slender, each with 12–14 batonnets occupying more than proximal half of tarsomere; claws shorter than the tarsomere, slender, equal, and each bearing a basal, gently curved, slender inner spur.

Abdomen: Dark brown dorsally and paler ventrally. Two spermathecae, dark brown, partly collapsed but one apparently slightly larger and measuring 0,064 by 0,056 mm.

Male. Unknown.

Pupa. Length 4,0 mm. Pale brown with some shagreen on anterior cephalothorax; apex of respiratory horn infuscated. Cephalothorax with dorsal setae minute, with very small basal tubercles, between these and the respiratory horn on each side a row of five small halfmoon-shaped unarmed tubercles. Operculum lost. Respiratory horn (Fig. 93) 0,25 mm long, slightly wider apically where it is darkened; bearing 14 apical spiracular openings in a fan shape; surface quite smooth except at extreme base where it is tracheoid (minutely transversely wrinkled). Abdomen dorsally and ventrally with small halfmoon tubercles which mostly do not bear setae, when these are present they are very small, delicate and hair-like; lateral tubercles triangular, decreasing in size from segments VIII to III (posterior to anterior), these also bear only minute hairs when armed (Fig. 91). Segment IX (Fig. 92) with minute backwardly directed spines; caudal processes widely divergent and bare.

Distribution. South Africa.

Type. Holotype ♀ (NM-2456), extracted from its pupal exuviae, Zoutpan, near Onderstepoort, Transvaal, 10.i.1974, A. L. Dyce (no. 74.109), bred from grassy 'vlei'.

Discussion. The species is named for Sir Arnold Theiler, the founder of the Onderstepoort Veterinary Research Institute, known for its significant contribution on the veterinary importance of the biting midges.

The lack of significant numbers of short, dark spines on the femora places this species near *S. litoaurea* Ingram & Macfie, known only from the male sex from West Africa. The single radial cell of *S. theileri* separates it immediately.

Tribe Palpomyiini

Genus *Bezzia* Kieffer*Bezzia africana* Ingram & Macfie

Bezzia africana Ingram & Macfie, 1923: 71 (♀; Cape Prov.; figs); de Meillon, 1943: 107 (♂; Transvaal; figs); Haeselbarth, 1975: 357 (redescribed; figs; distribution; syn.: *hopkinsi*).
Bezzia hopkinsi de Meillon & Hardy, 1954: 62 (♂; Cameroun; figs).

Distribution. South Africa, Cameroun, Madagascar, Zimbabwe.

Material examined. SOUTH AFRICA: *Transvaal*. Magaliesberg Agric. School, 13.xi.1973 (no. 73.340), reared from stream margin, 1 ♂ with pupal exuviae. Burgershall, Hazyview, 3.xiii.1973 (no. 73.361), reared from margin of water storage dam, 1 ♂ with pupal exuviae.

Bezzia flavicorporis de Meillon

Bezzia flavicorporis de Meillon, 1939a: 229 (♂, ♀; Zululand; figs).

Distribution. South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Zoutpan, near Onderstepoort, 10.i.1974 (no. 74.110), hoof holes in sandy creek bed, 1 ♀ with pupal exuviae.

Bezzia amana sp. n. (Figs 94–98)

A uniformly dark brown species with unbanded femora and tibiae and paler tarsi.

Holotype ♀. Wing length 1,1 mm.

Head: Eyes bare; widely separated by a wedge-shaped space which does not bear any long bristles. Antenna rather short, segments III–XV measuring just under 0,5 mm in length, less than 1,5 times as long as width of head; poorly supplied with setae except for the long sensilla chaetica; relative lengths of X–XV, 13–18–20–20–20–25; antennal ratio 1,47; III–X slightly paler basally, XI–XV uniformly brown. Palpus (Fig. 94) five-segmented and only slightly longer than proboscis; segment III parallel sided with some capitate sensilla on medial side, not in a clump. Mandible with seven large teeth plus a number of smaller proximal ones.

Thorax: Mesonotum dark brown, densely covered with short spine-like setae and a few longer bristles; scutellum and postnotum dark brown; pleuron a shade paler; pre-, post-, and subspiracular areas with small short setae much as on mesonotum. Wing unornamented and without macrotrichia; with exception of costa and radius veins poorly marked (staining was necessary to reveal the venation in the medial field); media just sessile, the two branches meeting at the base of the crossvein and before the bifurcation of the cubitus; costal ratio 0,68. Legs with coxae, trochanters, femora and tibiae concolorous with pleuron, tarsi a shade paler; femora and tibiae not swollen; fore femur armed with one black stout sharp spine on one leg and two such spines on the other; mid and hind femora unarmed; fore tibia with a long apical spur and an apical curved comb of ten or more closely set, semitransparent spines; mid tibia unarmed; hind tibia with an apical row of eight long spines and a subapical comb of numerous short transpar-

ent teeth, apical spur indistinguishable; fore tarsomeres I–V without any modified bristles or spines; mid tarsomere I with a pair of pale spines apically, the rest of the tarsomeres unarmed; hind tarsomere I straight and parallel-sided with a double row of bulbous hairs running the length of segment, a row of bulbous hairs on tarsomere II and a few on III, the rest without modified hairs; tarsomere IV cordiform; V long and slender, claws short, equal, strong and simple on all legs.

Abdomen: A shade paler than thorax with a single pair of sclerotised gland rods; genital sclerites not strongly developed. Two spermathecae (Fig. 95), thick walled, very dark and strongly sclerotised, the larger oval to slightly spindle shaped, the other much smaller and ovoid (collapsed); ducts not sclerotised; measurements 0,100 by 0,060 mm and 0,050 mm in diameter.

Male. Unknown.

Pupa. Length 2,9 mm. Dorsum of cephalothorax and respiratory horn dark brown, the rest paler. Respiratory horn (Fig. 96) of the usual type seen in the genus; straight, nearly parallel-sided, and with 17 spiracular openings arranged in a fan at apex; length 0,18 mm. Cephalothorax shagreened dorsally, the dorsal tubercles very small, three of them each with a short, delicate hair. Abdomen noticeably paler than cephalothorax, tubercles small (Fig. 97) and nipple-like, many of them provided with short, stiff hairs or delicate spines; terminal segment (Fig. 98) long with divergent, sharply pointed caudal processes, surface with minute backwardly directed spinules.

Distribution. South Africa.

Type. Holotype ♀ (NM-2457) with associated pupal exuviae, Zoutpan, near Onderstepoort, Transvaal, 10.i.1974, A. L. Dyce (no. 74.113), margin of a brackish spring in crater.

Discussion. The uniformly dark, unbanded legs and peculiar shaped spermathecae immediately distinguish this species from all other Subsafrican species where the female is sufficiently known.

Genus *Phaenobezzia* Haeselbarth

Phaenobezzia cinnae (de Meillon)

Palpomyia cinnae de Meillon, 1936: 185 (♂, ♀; Zululand; figs); de Meillon, 1937a: 386 (fig. pharynx). *Phaenobezzia cinnae* (de Meillon); Haeselbarth, 1965: 304 (combination; redescribed; figs; distribution).

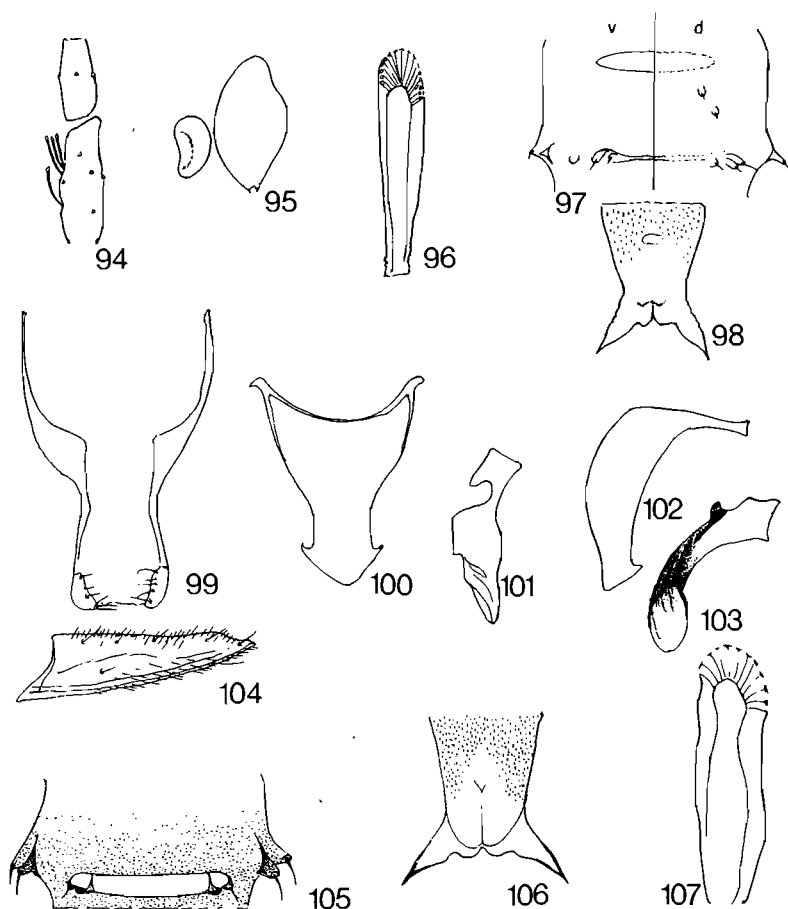
Distribution. Natal, Transvaal, Zimbabwe, Mozambique.

Material examined. SOUTH AFRICA: *Transvaal*. Burgershall Tropical Fruit Res. Station, Hazyview, 3.xii.1973 (no. 73.361), margins of water storage dam, 1 ♂ with pupal exuviae.

Phaenobezzia mashonensis (Ingram & Macfie)

Bezzia (*Probezzia*) *mashonensis* Ingram & Macfie, 1923: 73 (♀; Rhodesia; figs) *Phaenobezzia mashonensis* (Ingram & Macfie); Haeselbarth, 1965: 310 (combination; redescribed; figs).

Distribution. Zimbabwe, Liberia, Senegal, Mozambique, South Africa.



Figs 94-98, *Bezzia amana*; 99-107, *Palpomyia magali*: 94, palpal segments III and IV of female; 95, female spermathecae; 96, 107, pupal respiratory horn; 97, abdominal segment VII of pupa, dorsal right, ventral left; 98, 106, abdominal segment IX of pupa; 99, ninth tergum of male genitalia; 100, male aedeagus and 101, paramere, ventral view; 102, male aedeagus and 103, paramere, lateral view; 104, male dististyle; 105, posterior portion of pupal abdominal segment VII, ventral view.

Material examined. SOUTH AFRICA: *Transvaal*. Sand River between White River and Hazyview, 2.xii.1973 (no. 73.358), stream margin, 1 ♀ with pupal exuviae. Burgershall, Hazyview, 3.xii.1973 (no. 73.361), margin of water storage dam, 2 ♂ with pupal exuviae.

Remarks. An excellent description of the male, female, and pupa was provided by Haeselbarth (1975), making species determination easy.

Phaenobezzia vacunae (de Meillon)

Bezzia (*Probezzia*) *vacunae* de Meillon, 1936: 180 (♂, ♀; Natal; figs); de Meillon, 1937a: 386 (♀ pharyngeal armature).

Phaenobezzia vacunae (de Meillon); Haeselbarth, 1965: 314 (combination; redescribed; figs).

Distribution. South Africa.

Material examined. SOUTH AFRICA: *Transvaal*. Sand River between White River and Hazyview, 2.xii.1973 (no. 73.358), stream margin, 1 ♂ with pupal exuviae.

Genus *Palpomyia* Meigen

***Palpomyia magali* sp. n. (Figs 99–107)**

Described from the male holotype. A dark robust species with apical third of hind femur and all of mid and hind tibiae darker than rest of leg segments; fore femur armed with three spines, others unarmed; abdomen paler than thorax.

Holotype ♂. Wing length 1,4 mm.

Head: Dark brown. Eyes widely separated, bare. Antenna with flagellum dark brown, poorly supplied with verticils; lengths of segments XIII–XV, 20–60–70; antennal ratio 1,35. Palpus with third segment not swollen, without sensory pit, and slightly shorter than fourth and fifth combined.

Thorax: Mesonotum, postnotum and pleuron dark brown, mesonotum without anterior spines; scutellum paler; sub- and postspiracular area of pleuron with about 13 slender but stiff hairs. Legs with femora not swollen, hind femur pale on proximal 0,67, mid femur dark throughout and fore femur paler; hind and mid tibiae dark, fore tibia a shade paler; tarsomeres all pale except fifth on all legs which are slightly infuscated. Fore femur armed with 2–4 rather widely spaced, short black spines; basitarsus and second tarsomere on hindleg with double row of bulbous hairs; basitarsus of midleg with a single row of such hairs, all other tarsomeres unarmed; hind tibia with a long seta apically and a closely set comb of 20 or more short dark spines subapically; fore tibia without an apical row of long setae but with a closely set comb of 20 or more somewhat transparent spines; fifth tarsomeres unarmed, claws simple, equal, short and only slightly curved. Wing unornamented; with two well formed radial cells, the second 1,5 times length of first; costal ratio 0,74. Halter somewhat infuscated.

Abdomen: Except for the dark terminal segment, paler than thorax. Genitalia (Fig. 99–104) dark and strongly sclerotised; basistyle long and narrow, of about even width throughout; dististyle (Fig. 104) short, gradually narrowing to blunt apex, with a few short hairs and numerous fine setae giving the whole a fuzzy appearance. Aedeagus (Fig. 100) of the type usually seen in *Palpomyiini*; parameres (Fig. 101) separate, highly sclerotised except at apex which is without any pigment; in side and ventral views as figured (Figs 102–103).

Female. Unknown.

Pupa. The associated pupal skin is brown with apical region of cephalothorax darker due to presence of numerous small tubercles. Respiratory horn (Fig. 107) 0,20 mm long, of the usual type seen in *Palpomyiini*, with 11 spiracular openings. Abdomen with ninth segment (Fig. 106) provided with many small, backwardly directed spines (on eighth segment these spines appear to be directed towards base of abdomen); caudal processes sharply pointed and widely separated. Segments III or IV to VII each (Fig. 105) with a narrow, transverse, elongated clear space near ventral apical border; dorsally on the abdomen there is one such

space subapically and another sub-basally; these clear spaces tend to become obscure toward base of abdomen; lateral abdominal tubercles, though not very prominent, bear spines as illustrated.

Distribution. South Africa.

Type. Holotype ♂ (NM-2458), with associated pupal exuviae, Magaliesberg Agric. School, Transvaal, 13.xi.1973, A. L. Dyce (no. 73.340), reared from river margin.

Discussion. This species is named for Magali, the tribal chief after whom Magaliesberg was named by the early European pioneers.

Palpomyia magali keys out in Macfie's (1939) partial key to *P. portali* Macfie, known only from the female, which also is a dark brown species with banded leg markings, but in *portali* the mid tibia is yellowish brown like the fore tibia, and the fore femur bears 10 ventral spines. In Goetghebuer's (1948) key to the Zaïre *Palpomyia*, *magali* would key out to *P. rutshuruensis* Goetghebuer and *P. nitidissima* Goetghebuer, both species differing in bearing ventral spines on all the femora.

REFERENCES

- CARTER, H. F., INGRAM, A. & MACFIE, J. W. S. 1920-21. Observations on the ceratopogonine midges of the Gold Coast, with descriptions of new species I-IV. *Ann. Trop. Med. Parasit.* **14**: 187-274, 309-331, 5 plates (1920); **15**: 177-212 (1921).
- CLASTRIER, J. 1958. Notes sur les Cératopogonidés. IV.—Cératopogonidés d'Afrique Occidentale Française. *Archs. Inst. Pasteur Alger.* **36**: 192-258.
- 1959. Notes sur les Cératopogonidés. VIII.—Cératopogonidés de l'Ile de la Réunion. *Archs. Inst. Pasteur Alger.* **37**: 412-456.
- 1960. Notes sur les Cératopogonidés. X. Cératopogonidés de la République du Congo (2). *Archs. Inst. Pasteur Alger.* **38**: 258-298.
- CLASTRIER, J., & WIRTH, W. W. 1961. Notes sur les Cératopogonidés. 14. Cératopogonidés de la Région Éthiopienne (2). *Archs. Inst. Pasteur Alger.* **39**: 302-337.
- DESSART, P. 1962. Contribution à l'étude des Ceratopogonidae (Diptera) IV. Les *Forcipomyia* pollinisateurs du cacaoyer (2). *Revue Zool. Bot. Afr.* **65**: 139-148.
- 1963. Contribution à l'étude des Ceratopogonidae (Diptera) (VII). Tableaux dichotomiques illustrés pour la détermination des *Forcipomyia* Africains. *Mém. Inst. R. Sci. Nat. Belg.* (2 Ser.), fasc. 72, 151 pp., 16 plates.
- EDWARDS, F. W. 1926. On the British biting midges (Diptera, Ceratopogonidae). *Trans. Ent. Soc. Lond.* **74**: 389-426, 2 plates.
- GOETGHEBUER, M. 1933. Ceratopogonidae et Chironomidae du Congo Belge. *Revue Zool. Bot. Afr.* **24**: 129-151.
- 1948. Ceratopogonidae (Diptera Nematocera). *Explor. Parc natn. Albert Miss. G. F. de Witte* **55**: 3-21.
- GROGAN, W. L., JR., & WIRTH, W. W. 1977. A revision of the Nearctic species of *Parabezzia* Malloch (Diptera: Ceratopogonidae). *J. Kans. Ent. Soc.* **50**: 29-83.
- HAESSELBARTH, E. 1965. *Phaenobezzia* a new genus of biting midges (Diptera: Ceratopogonidae), with a review of the African species. *Z. Angew. Zool.* **52**: 297-324.
- 1975. Zur Kenntnis von *Bezzia africana* Ingram & Macfie und verwandten Arten aus der äthiopischen Region (Diptera: Ceratopogonidae). *Ent. Ger.* **1**: 352-370.
- INGRAM, A., & MACFIE, J. W. S. 1921. West African Ceratopogoninae. *Ann. Trop. Med. Parasit.* **15**: 312-374.
- 1922. West African Ceratopogoninae Part II. *Ann. Trop. Med. Parasit.* **16**: 243-282.
- 1923. Notes on some African Ceratopogoninae. *Bull. Ent. Res.* **14**: 41-74.
- 1924. Notes on some African Ceratopogoninae—species of the genus *Forcipomyia*. *Ann. Trop. Med. Parasit.* **18**: 533-593.
- MACFIE, J. W. S. 1924. On some Egyptian Ceratopogoninae. *Bull. Ent. Res.* **15**: 61-67.
- 1932. Some new or little-known Ceratopogonidae. *Ann. Mag. Nat. hist.* (10) **9**: 485-499.
- 1939. Ruwenzori Exped. 1934-1935. Vol. 1, no. 5. Ceratopogonidae. With an appendix by Dr B. de Meillon. *Brit. Mus. (Nat. Hist.) London*, pp. 81-107.
- 1943. Ceratopogonidae (Diptera) from Egypt. *Proc. R. Ent. Soc. Lond.* (B) **12**: 145-159.
- MAYER, K. 1955. Beitrag zur Ökologie und Morphologie afrikanischer Heleiden (Dipt.). *Arch. Hydrobiol.* **51**: 98-117.

- MEILLON, B. DE 1936. Entomological Studies. Studies on insects of medical importance in South Africa. Part III. South African Ceratopogonidae. Parts I and II. *Publ. S. Afr. Inst. Med. Res.* 7: 136–207.
- 1937a. Entomological Studies. Studies on insects of medical importance from southern Africa and adjacent territories. (Part IV) Ceratopogonidae. 2. Records and species from South Africa. *Publ. S. Afr. Inst. Med. Res.* 7: 332–385.
- 1937b. A new *Jenkinshelea* (Dipt. Ceratopogonidae) from Southern Rhodesia. *Ann. S. Afr. Mus.* 32: 261–263.
- 1939a. Notes on Ceratopogonidae (Dipt. Nematocera) from southern Africa. *J. ent. Soc. sth. Afr.* 1: 9–25.
- 1939b. Notes on Ceratopogonidae from southern Africa: II. *J. ent. Soc. sth. Afr.* 2: 7–17.
- 1940. Ceratopogonidae (Diptera, Nematocera) from southern Africa. *Trans. R. Ent. Soc. Lond.* 90: 455–466.
- 1942a. Ceratopogonidae (Dipt. Nematocera) from southern Rhodesia. *Proc. Trans. Rhod. Scient. Ass.* 39: 113–119.
- 1942b. Simuliidae and Ceratopogonidae (Dipt. Nematocera) from the colony of Mocambique. *Estação Anti-Malarica de Lourenço Marques*, 31 pp.
- 1943. New records and new species of Nematocera (Diptera) from the Ethiopian Region. *J. ent. Soc. sth. Afr.* 6: 90–113.
- 1961. The Madagascan Ceratopogonidae. *Revta. Ent. Moçamb.* 4: 37–65.
- MEILLON, B. DE, & HARDY, F. 1954. New records and species of biting insects from the Ethiopian Region V. *J. ent. Soc. sth. Afr.* 17: 62–85.
- MEILLON, B. DE, & WIRTH, W. W. 1979. Subsaharan Ceratopogonidae (Diptera) IV. *Rhinohelea*, a new subgenus of *Forcipomyia* from the south-west Cape Province, South Africa. *Ann. Natal Mus.* 23: 881–886.
- 1981. Subsaharan Ceratopogonidae (Diptera) V. *Kolenhelea*, a new genus of African Stilobezziini. *Ann. Natal Mus.* 24: 00–00.
- TOKUNAGA, M., & MURACHI, E. K. 1959. Diptera: Ceratopogonidae, pp. 103–434, In: B. P. Bishop Mus. Insects of Micronesia 12: 1–434.
- VATTIER, G., & ADAM, J. P. 1966. Les Ceratopogonidae (Diptera) des grottes de la Republique du Congo (Brazzaville). *Annl. Speleol.* 21: 711–773.
- WIRTH, W. W. 1952. The Helicidae of California. *Univ. Califs. Publs. Ent.* 9: 95–266.
- 1962. A reclassification of the *Palpomyia-Bezzia-Macroepeza* groups, and a revision of the North American Sphaeromiini (Diptera, Ceratopogonidae). *Ann. Ent. Soc. Am.* 55: 272–287.
- WIRTH, W. W., & RATANAWORABHAN, N. C. 1972. Notes on the genus *Macroepeza* Meigen and description of a new species from Florida (Diptera: Ceratopogonidae). *Fla. Ent.* 55: 213–217.
- WIRTH, W. W., RATANAWORABHAN, N. C., & BLANTON, F. S. 1974. Synopsis of the genera of Ceratopogonidae (Diptera). *Annl. Parasit. Hum. Comp.* 49: 595–613.
- WIRTH, W. W., RATANAWORABHAN, N. C. & MESSERSMITH, D. H. 1977. Natural History of Plummers Island, Maryland. XXII. Biting midges (Diptera: Ceratopogonidae). 1. Introduction and key to genera. *Proc. Biol. Soc. Wash.* 90: 615–647.

Date received: 17 March 1980.

APPENDIX

List of Data and Species Identifications

All specimens were collected by A. L. Dyce in South Africa, and were reared from pupae and preserved with the associated exuviae except for two light trap collections (nos. 73.347 and 73.396).

- 73.316—Doornpan, Bulge River, N. Transvaal, 6.xi.1973, ground water pool.
1 ♀ *Homoelea albitudinis* sp. n.; 1 ♀ *Parabezzia stagni*.
- 73.318—Same as 316, but from algae covered sand, overflow from aviary drink tray.
1 ♂ *Dasyhelea thompsoni* de Meillon; 22 ♂ 16 ♀ *D. fusca* Carter, Ingram & Macfie.
- 73.320—Leamington, Matlabas, N. Transvaal, 7.xi.1973, stock tank overflow.
1 ♀ *Dasyhelea fusca* C. I. & M.
- 73.321—Same as 320, but from brackish spring head.
1 ♂ *Dasyhelea inconspicua* C. I. & M.; 1 ♂ 2 ♀ *D. salinaria* sp. n.; 1 ♀ *Bezzia* sp.
- 73.324—Sentrum, N. Transvaal, 8.xi.1973, leaking stock trough.
2 ♀ *Dasyhelea fusca* C. I. & M.
- 73.338—Magaliesberg Agricultural School, Transvaal, 13.xi.1973, tree hole.
3 ♂ 3 ♀ *Dasyhelea* sp. near *retorta* Ingram & Macfie.
- 73.339—Same as 338, but from drain from animal stable.
1 ♀ *Alluaudomyia* sp.; 1 ♀ *Culicoides* sp.; 1 ♀ *Forcipomyia* sp.

- 73.340—Magaliesberg Agricultural School, Transvaal, 13.xi.1973, river margin.
1 ♂ *Bezzia africana* I. & M.; 1 ♂ *Mallochohelea erinnae* (de Meillon); 1 ♂ *Palpomyia magali* sp. n.
- 73.341—Lydenburg (Fish Hatchery), E. Transvaal, 26.xi.1973, moss band with silt in cement water drain between fish tanks.
14 ♂♀ *Dasyhelea fusca* C. I. & M.
- 73.342—Same as 341, but from lily pond margins.
3 ♂ 1 ♀ *Alluaudomyia melanosticta* (I. & M.)
- 73.347—Hectorspruit, E. Transvaal, 28–29.xi.1973, light trap.
1 ♂ 1 ♀ *Atrichopogon* sp.; 1 ♀ *Forcipomyia* sp.
- 73.348—Lodwicks Lust, Hectorspruit, E. Transvaal, 29.xi.1973, irrigation waste water drain.
9 ♂♀ *Dasyhelea fusca* C. I. & M.
- 73.350—Same as 348, but from sunlit roadside borrow pit.
1 ♀ *Dasyhelea* sp.
- 73.351—Same as 348, but from shaded rock pool in creek.
1 ♂ 1 ♀ *Dasyhelea thompsoni* de Meillon.
- 73.355—20 km S. Komatipoort, E. Transvaal, 1.xii.1973, overflow from stock water tank.
10 ♂♀ *Dasyhelea fusca* C. I. & M.
- 73.357—Jam Tin Creek (near Malelane), E. Transvaal, 2.xii.1973, margins of running stream.
3 ♀ *Dasyhelea gigantosalphinx* de Meillon; 1 ♂ *Calicoides* sp.; 2 ♂ *Stilobezzia limnophila* I. & M.; 1 ♂ 1 ♀ *Palpomyia*, 2 species.
- 73.358—Sand River N on road between White River and Hazyview, E. Transvaal, 2.xii.1973, stream margins.
1 ♂ *Alluaudomyia natalensis* de Meillon; 1 ♀ *Jenkinshelea rhodesiensis* de Meillon; 1 ♀ *Mallochohelea fluminea* sp. n.; 1 ♀ *Phaenobezzia mashonensis* (I. & M.); 1 ♂ *P. vacunae* (de Meillon); 1 ♀ *Palpomyia* sp.
- 73.359—Burgershall Tropical Fruit Research Station, Hazyview, E. Transvaal, 3.xii.1973, rotting pseudostems of banana.
1 ♂ *Dasyhelea flava* C. I. & M.
- 73.360—Same as 359, repeat.
4 ♂ 5 ♀ *Dasyhelea flava* C. I. & M.; 1 ♂ 3 ♀ *Forcipomyia ashantii* I. & M.; *Forcipomyia* sp. larvae.
- 73.361—Same as 359, but from margins of water storage dam.
1 ♀ *Stilobezzia limnophila* I. & M.; 1 ♀ *Stilobezzia* sp.; 2 ♂ *S. orientis* sp. n.; 1 ♂ *Macropeza geari* sp. n.; 1 ♀ *Mallochohelea fluminea* sp. n.; 1 ♂ *Bezzia africana* I. & M.; 2 ♂ *Phaenobezzia mashonensis* (I. & M.); 1 ♂ *P. cinnae* (de Meillon).
- 73.362—Sabi River Area (mountain top), E. Transvaal, 3.xii.1973, rock pools in 'Tabletop Sandstone'.
1 ♂ 3 ♀ *Dasyhelea thompsoni* de Meillon.
- 73.364—Hectorspruit, E. Transvaal, 29.xi.1973, fallen fruit of sausage tree.
Many ♂ & ♀ *Forcipomyia biannulata* I. & M.
- 73.366—25 mi E Middleburg, Sewfontein, Transvaal, 5.xii.1973, brackish pan.
3 ♂ 1 ♀ *Dasyhelea fontana* sp. n.
- 73.368—Onderstepoort, Transvaal, 8.xii.1973, drain from roof catchment.
4 ♂ 3 ♀ *Dasyhelea tugelae* de Meillon.
- 73.387—7 km S Messina, N. Transvaal, 26.xii.1973, crotch in baobab tree.
3 ♂ 5 ♀ *Dasyhelea tugelae* de Meillon.
- 73.396—Sterkstroom, E. Louis Trichardt, N. Transvaal, 30–31.xii.1973, light trap.
2 ♂ *Forcipomyia statirae* de Meillon; 1 ♂ *F. randensis* de Meillon; 1 ♂ *F. biannulata* I. & M.; 1 ♂ *F. fuliginosa* (Meigen); 1 ♂ *F. psilonota* Kieffer; 1 ♂ *F. eshowensis* de Meillon; 2 ♂ *F. chrysolopha* Kieffer; 1 ♂ *F. pulla* sp. n.; 1 ♂ 1 ♀ *F. warreni* sp. n.; 1 ♂ 1 ♀ *Alluaudomyia melanosticta* (I. & M.); 2 ♂ 1 ♀ *A. louisi* sp. n.; 1 ♂ *Kolenhelea dycei* de Meillon & Wirth; many ♂ & ♀ *Fanihamia ornatipennis* de Meillon; ♂ & ♀ *Atrichopogon*; ♀♀ *Forcipomyia* sp.
- 74.101—½ mi N Tropic Capricorn on Louis Trichardt Rd., N. Transvaal, 1.i.1974, tree cavities in candelabra trees.
4 ♂ 6 ♀ *Dasyhelea tugelae* de Meillon.
- 74.102—Same as 101, but from rock pool in granite outcrop.
4 ♂ 6 ♀ *Dasyhelea thompsoni* de Meillon.
- 74.105—15 mi SE Potgietersrus, Transvaal, 3.i.1974, margins small hill stream.
1 ♀ *Alluaudomyia natalensis* de Meillon; 1 ♂ *Dasyhelea fusca* C. I. & M.; 1 ♀ *Stilobezzia* sp.; 1 ♀ *Isohelea* sp. near *alcides* (de Meillon and Hardy).
- 74.106—Same as 105, but in tree hole.
7 ♂ 7 ♀ *Dasyhelea tugelae* de Meillon; 1 ♀ *Isohelea* sp. near *alcides* (de Meillon and Hardy).
- 74.108—Sterkrivier Road, SW Potgietersrus, Transvaal, 3.i.1974, roadside seepage bank.
1 ♂ 1 ♀ *Stilobezzia limnophila* I. & M.; 17 ♂♀ *Dasyhelea inconspicua* C. I. & M.; 1 ♀ *Bezzia* sp.
- 74.109—Zoutpan (near Onderstepoort), N. Transvaal, 10.i.1974, grassy vlei (brack).
2 ♂ 4 ♀ *Dasyhelea* sp.; 4 ♂ 3 ♀ *Homohelea delanoe* (de Meillon); 1 ♀ *Sphaeromias theileri* sp. n.; 1 ♂ *Forcipomyia (Euprojoannisia)* sp.

- 74.110—Same as 109, but hoof holes in sandy creek bed.
 1 ♂ *Dasyhelea inconspicua* C. I. & M.; 1 ♂ *D. fusca* C. I. & M.; 1 ♂ *Alluaudomyia melanosticta* (I. & M.); 1 ♀ *Bezzia flavicorporis* de Meillon.
- 74.113—Same as 109, but margin brack spring in crater.
 1 ♀ *Bezzia amana* sp. n.
- 74.125—Stella, N. Cape Province, 17.i.1974, margins of large brack pan.
 2 ♂ *Dasyhelea inconspicua* C. I. & M.; 1 ♂ *Forcipomyia (Thyridomyia)* sp.
- 74.130—Steekdoring, 40–50 km SW Vryburg, N. Cape Prov., 18.i.1974, polluted stockyards.
 1 ♀ *Dasyhelea* sp.
- 74.138—Kuruman, N. Cape Prov., 21.i.1974, margins of flowing stream.
 3 ♀ *Dasyhelea* sp.
- 74.140—Riet Rivier, 37 km SW Kimberley, Cape Prov., 22.i.1974, roadside groundwater pool.
 1 ♀ *Dasyhelea* sp.
- 74.146—10 mi NE Douglas, Cape Prov., 23.i.1974, rainwater pool.
 1 ♂ *Dasyhelea fusca* C. I. & M.; 1 ♀ *Nilobezzia robusta* de Meillon.
- 74.153—Lodwicks Lust, Hectorspruit, E. Transvaal, 21.i.1974, bred from fallen fruit of sausage tree (repeat of 73.364) 64 ♂♀ *Dasyhelea pallidihalter* C. I. & M.